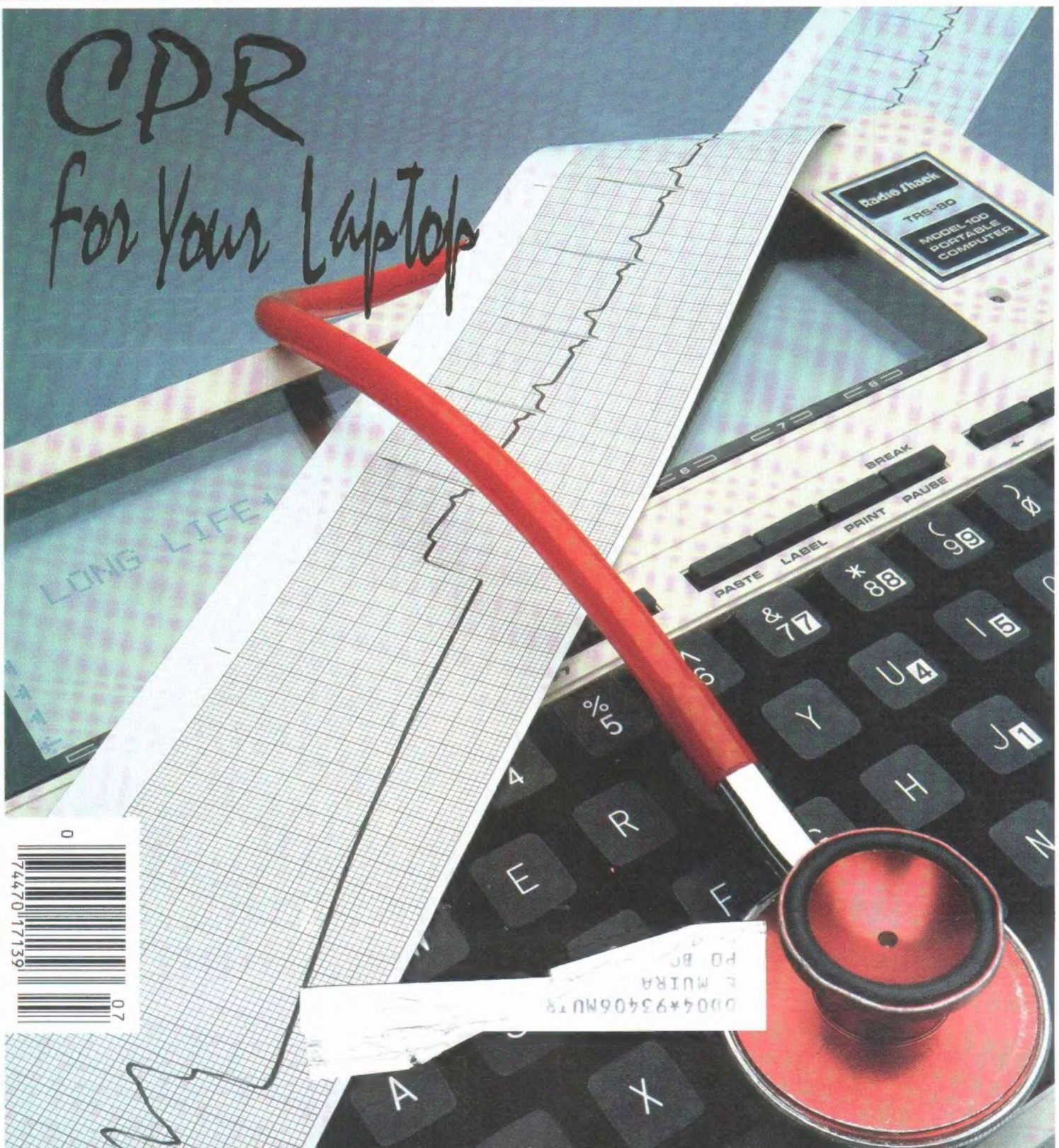


# portable

100/200/600 TANDY LAPTOP COMPUTING

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**All on one ROM. Truly the finest four programs  
available for the Model 100 — guaranteed.  
Try it for 30 days. If you aren't blown away by the  
excellence return it for a full refund.**

# \$199<sup>95</sup>

The four best programs for the Model 100 all on one ROM. 32K of power without using any RAM for program storage. This is the PCSG Snap-In ROM that just presses easily into the little ROM socket in the compartment on the back. You access the four right from the main menu like built-ins.

Write ROM — the definitive word processor for the Model 100. Function key formatting or dot commands. Search and replace. Library feature — inserts words, phrases or whole documents into text from just a code. MAP lets you see a picture of your document. In all there are 60 features and functions. No one can claim faster operation. FORM lets you create interactive forms with on-screen prompts that you can answer from the keyboard. Nothing else for the Model 100 compares with the features of Write ROM. Exactly the same as the Write ROM sold as a single program. Infoworld says it "makes the Model 100 a viable writing unit ... sur-

passed our highest expectations for quality and clarity."

Lucid Spreadsheet: This is the one PICO magazine says "blows Multiplan right out of the socket" and Infoworld performance rated as "excellent" and said "makes the Model 100 compute." Gives you features you cannot get with Lotus 123. Lets you build spreadsheets in your Model 100 that would consume 140-150K on a desktop. Program generating capability with no programming knowledge required. Variable column widths. Includes find and sort with function key control. It's fast, recalculates like lightning. No feature has been taken from the original, only new ones added.

Database: This is a relational data base like no other. You can do everything from mailing lists to invoices. No complicated pseudo-coding, you create input screens as simply as typing into TEXT. You are not limited by size; you can have as large an input screen as you wish. Prints out reports or forms, getting information from as many files as

you like. Complete math between fields. Total interface with Lucid worksheets.

Outliner: Does everything that Think-tank does on a PC but a whole lot better. Includes a Sort for your headlines. Lets you have headlines of up to 240 characters. Has cloning, hoisting and sideways scroll up to 250 characters. Like Lucid, this one sets a new standard for outliners. This is the way to plan and organize your projects.

Present Lucid and Write ROM owners can upgrade for \$150. If you have both it's \$125.

As usual PCSG sells the Super ROM on a thirty day guarantee. If for any reason you are not satisfied, simply return it for a full refund.

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"excellent"

**PCSG says "Satisfaction Guaranteed  
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Thirdly, LUCID<sup>®</sup> has features you won't find in most other spreadsheets. For example, when you type a label (text) it will cross column boundaries; in other words when you type a label or title it will appear as you type it irrespective of column or width. LUCID<sup>®</sup> also allows you to set column widths individually, and of course LUCID<sup>®</sup> has insert row and insert columns, as well as other standard features. LUCID<sup>®</sup> even lets your formulas refer to cells in other spreadsheet files.

Further, LUCID<sup>®</sup> has what no other spreadsheet has: Cut, Copy, and Paste. It uses the same keys as Cut and Paste in TEXT, but here's the difference: it takes all the formulas with it when you paste and they all automatically recalculate with the entire sheet.

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LUCID<sup>®</sup> has so many features that you will say "this is what I need in a spreadsheet", such as automatic prompting of an incorrectly typed-in formula showing just where the mistake was made.

LUCID<sup>®</sup> has expanded "go to" functions that remember and produce a windowing capability.

But perhaps most remarkable is that LUCID<sup>®</sup> is not only a spreadsheet but a program generator as well. First, LUCID<sup>®</sup> lets you protect all cells against entry or change, and then unprotect just the cells you want for someone else to use as input fields.

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You can prepare a report section in your spreadsheet with instructions to your user for printout, and they can produce a personalized printout that responds to their input. All your formulas and tables that did the calculations and provided the facts are invisible to that user. LUCID<sup>®</sup> is useful for doctors for patient questionnaires, troubleshooting technicians, purchase clerks, people doing job quotes, stores for customer workups, insurance agents and anybody who needs to process specific facts and numbers to produce a report based on those responses.

LUCID<sup>®</sup> comes with a manual that explains not only the characteristics of LUCID<sup>®</sup>, but will train you how to use a spreadsheet even if you have never seen one before. You are shown how to do budgets, forecasts, breakeven analysis amortizations and many other types of personal and business reports and calculations.

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## ROM WITH A VIEW

# What's in a Name?

Back in August 1985 I got a phone call from a guy in Michigan. He described himself as frustrated musician turned BASIC programmer/freelance writer. We talked for a while about a couple of programs he'd written and some that he was working on. At some point during the conversation, I remember him saying something about a Dvorak keyboard.

I didn't think much of it at the time. I hadn't a clue what a Dvorak keyboard was. The only Dvorak I'd ever heard of writes a column for *InfoWorld* — a monthly tabloid covering the computer industry. I assumed if somebody wanted his keyboard, well, they could just call him up and ask him for it. It bothered me though. Why would anyone want John Dvorak's keyboard?

Anyway, it was about a month later when I got another call from my Michigan friend. We talked for a half hour or so and just as I was about to sign off, he said, "By the way, I'm still working on the Dvorak keyboard." I said to myself, "He's actually plotting to get John Dvorak's keyboard. And he's referring to it as *the* Dvorak keyboard — like it was the Rolls Royce of keyboards." It all seemed pretty strange but I passed it off onto his being a frustrated musician. Either that or something was seriously wrong with Michigan's water.

Then around February of this year I received a letter from a reader who asked about the Dvorak keyboard. I just about fell out of my chair. Was this some kind of fad? I called my musician/programmer/writer friend and said, "You know you're not the only person who wants the Dvorak keyboard."

"Great!" he said. "I'd kind of lost interest in it but that's just the inspiration I need. I'll get it to you by next month."

"Get it to me?" I said, puzzled. "But I don't want John Dvorak's keyboard. You want his keyboard. You and this guy from Iowa." But it was too late. He'd already hung up.

The rest is history — and embarrassingly so. As promised, I received in the mail "the Dvorak keyboard" — a program (see page 44) for converting my Model 100's Qwerty keyboard to a Dvorak-style one. Oops. Wrong Dvorak.

The program's author, Mike Nugent, spent the better part of six months — in varying degrees of dedication — working on it. "From the outset," he says, "there were a variety of obstacles to overcome. But I just kept plugging away at it. I knew all along it could be done."

I've said before that the more difficult something seems to be, the more determined someone is to overcome it. Thanks Mike for proving my contention. And thanks too for not stealing John Dvorak's keyboard. I don't know if I could live with the guilt.

*Park M. Morrison*

Senior Editor





# portable

## 100/200/600

JULY 1986

VOLUME THREE, NUMBER ELEVEN

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Preventing crashes is the best way. But even when your system is down, it's not necessarily out.

*Cover photograph by Benjamin Magro*



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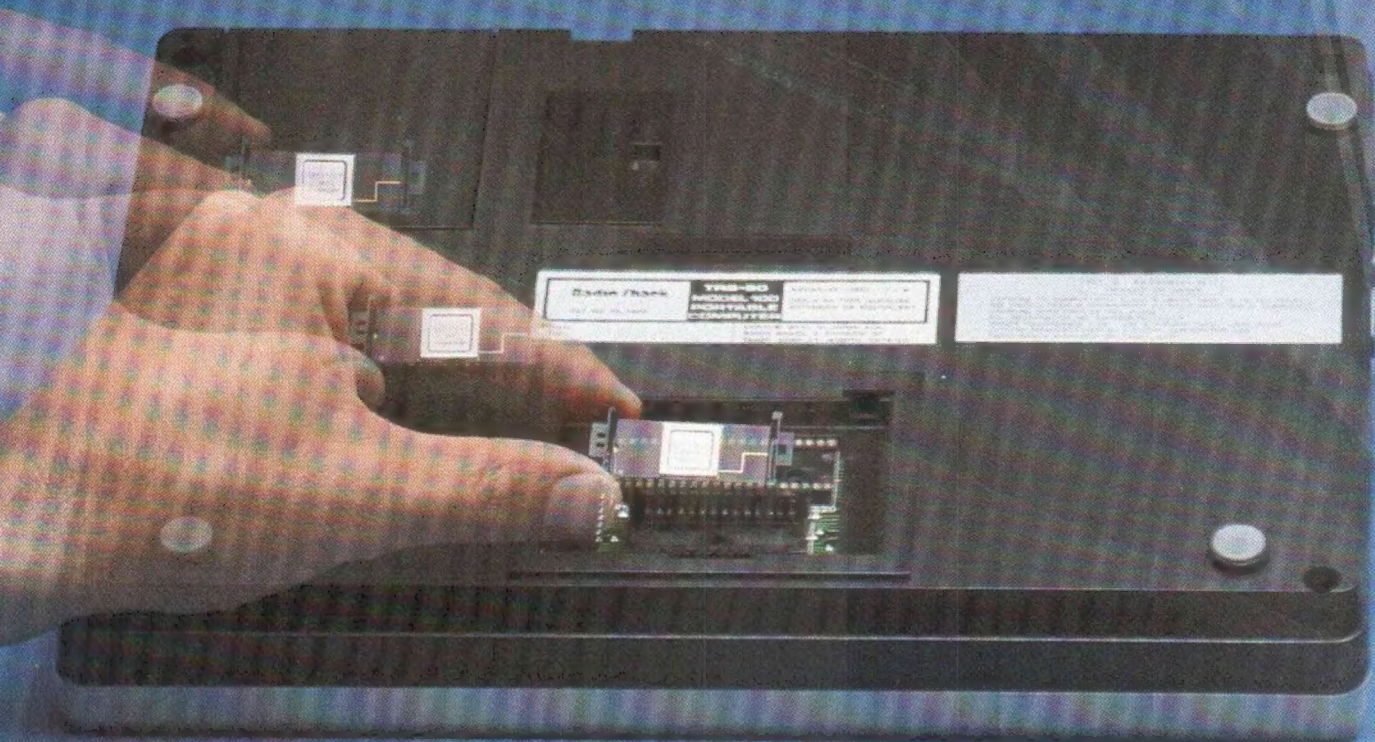
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# IF YOU'RE MISSING THIS, Add Multiplan or Interactive Solutions to

If you own a Model 100, then you already know. You know that the Model 100 comes with five built-in management programs. You know about the full-size typewriter-style keyboard and the direct-connect modem and telephone auto-dialer. But did you know how easy it is to boost your portable's power with Multiplan or Interactive Solutions?

You're really missing out if you don't know how easy it is to supercharge your Model 100. Just turn your machine over, pop in either of these high-performance ROM modules, and you've got a powerful

thing from complex spreadsheet analysis and calculations to sales forecasts, profit-and-loss projections, budgeting, pricing, engineering calculations and much more.

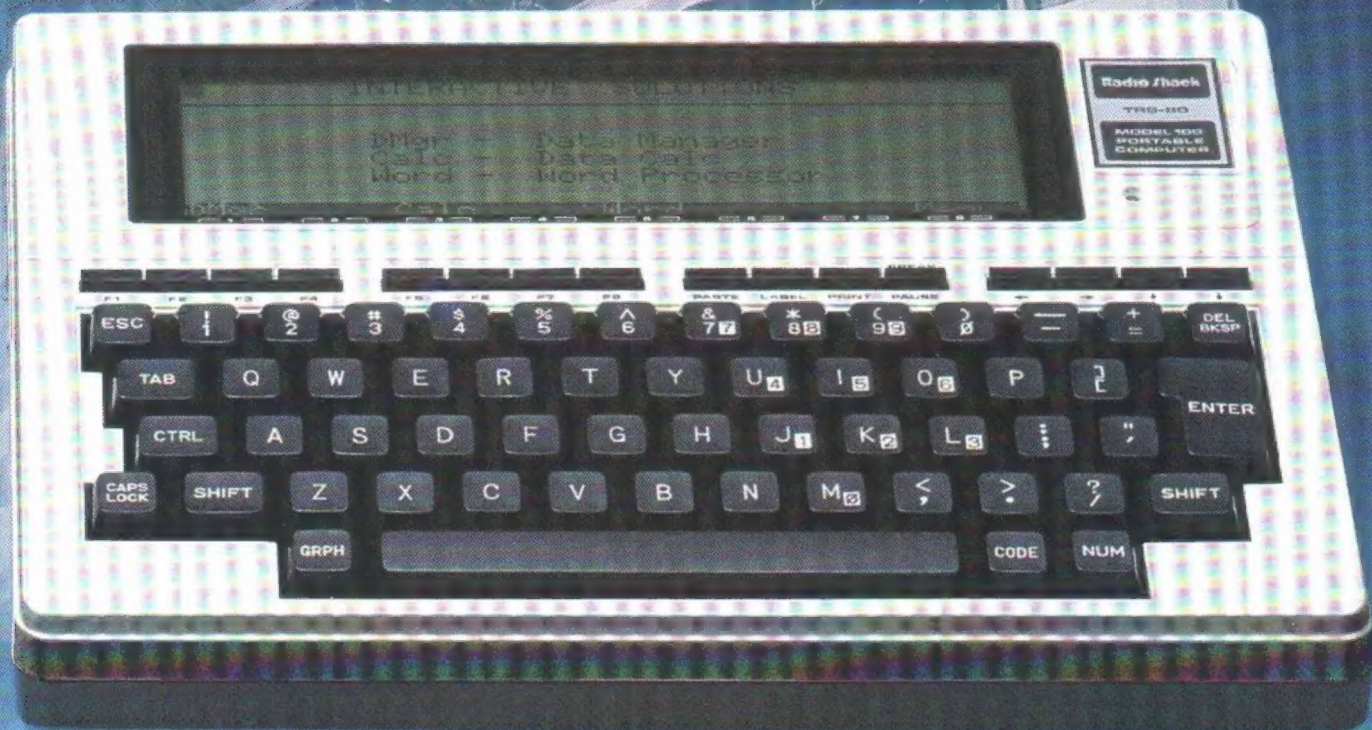
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number of variables. This lets you test plans by putting different values into your formulas.

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# Programs for Hire

*Make a few bucks on the side contracting your programming skills.*

By Leonard Grzanka

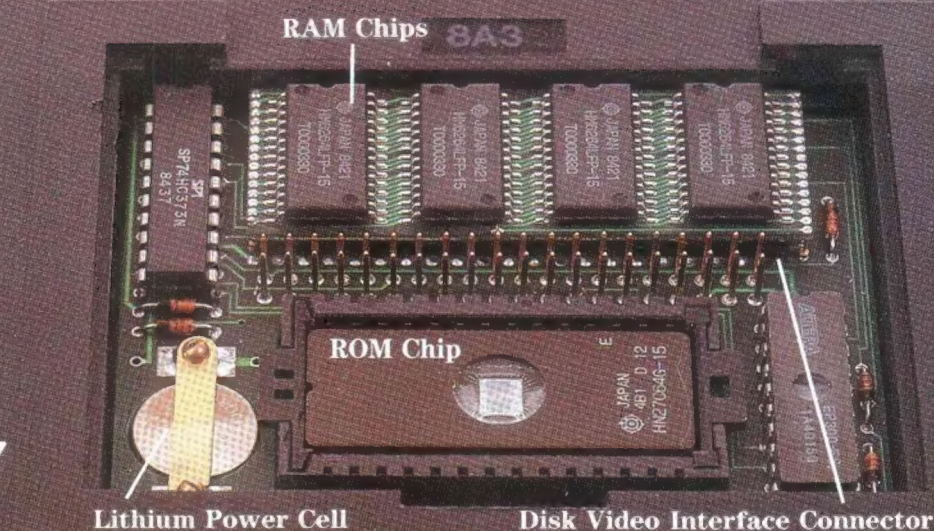
**F**or those with advanced programming skills and business experience or knowledge of an industry, contract programming can be extremely profitable. Most businesses perform unique, repetitive operations for which no standard, off-the-shelf program exists. If the company already owns a computer, it often makes sense for it to hire an outside contractor to produce a software program that performs these unique tasks.

Even with off-the-shelf programs, a company may hire a contract programmer to customize parts of the program to fit its unique needs — or to save time for the owner. For example, the owner of a small business, rather than taking the time to design on-screen data-entry forms for the clerical staff to follow when entering data, may prefer to hire an independent contractor to design and input the screens. But, depending on the programmer's skills, contract programming may also involve problems as complex as analyz-





# State of The Art RAM Technology

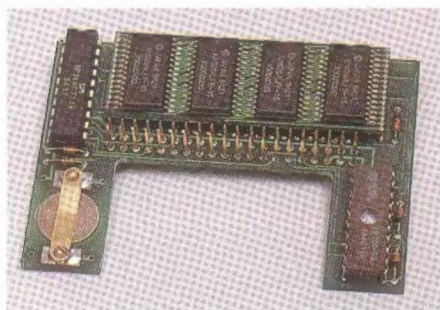


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Our miniaturized RAM chips are state of the art. They are the most advanced memory chips found anywhere in the world. Their tiny size allows us to keep a low profile in the expansion port of the Model 100. We use a technique called *vapor phase soldering* to ensure that each and every tiny connection is clean — perfect.



*The RAM module is precision constructed.*

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which allows data to be transferred from one bank to any other bank. It's flawless!

## Simple Installation

"Adding this 64K RAM module to your Model 100 is as easy as putting in new batteries." Once you've removed the expansion cover on the back of your Model 100, just snap the **PG Design** RAM module in. You can't get it wrong! The pins line up perfectly with the expansion holes in the Model 100 compartment. Snap the cover back on and turn your Model 100 over. Turn it on and enter BASIC. Type in the one line program we supply you and presto—you've got a Model 100 with 96K of RAM. You do not need a 32K Model 100 to utilize the **PG Design** 64K RAM module.

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The beauty of this RAM module is that we've enabled you to have a Model 100 with 96K of RAM and we've given you access to the other Model 100 options within the expansion compartment. The DVI connection can be made easily with our rugged connectors. Gone are the flat flimsy pins. And best of all, the ROM slot is clear to insert any ROM modules, (like Tandy's Multiplan on ROM). We designed this RAM module so it wouldn't ever have to be removed from your Model 100. But, if you should remove it, we've installed a lithium

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64K RAM module — \$375

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If you want only a 32K version of the RAM module, you may upgrade later for only \$150. The 32K version is constructed exactly as the 64K module.

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Call us at 313/727-2744, or write. We accept Visa and MasterCard, as well as check or money orders. We ship within five days of receiving your order.

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ing a potential client's business problem and system needs to design a complete, custom computer program or hardware configuration that solves the problem.

Some contract programming, such as writing simple routines or customizing off-the-shelf packages for small business, can be done at home. But many large companies require you to program on their premises during normal business hours. You should adjust your marketing strategies with this in mind if you're unwilling to work at the client's place of business.

## GETTING STARTED

The only way to begin as a contract programmer is to understand at least one computer language extremely well. "The basic qualification is that you're able to do the job," says Dr. Fred Abramson, president of Intellisys, a Sunnyvale, California company that recently developed and introduced a software package for personal computers that simulates and tests the logic of integrated circuit designs. Abramson adds that a broad computer background is equally important: "If you only understand BASIC or dBASE III specifications, you're likely to have some trouble because this limits you quite a bit. It narrows your thinking." Abramson, who holds master's degrees in electrical engineering and computer science as well as a doctorate in mathematics from MIT, worked as a contract programmer to meet expenses while designing the CAE program and organizing Intellisys.

Abramson also notes that a general business or industry background helps a lot: "The client needs your help with a problem, which is why you were called in. It's a process of mutual education: you have to teach the client about computer systems, and the client has to teach you about the company's business problem. You have to be open to learning the language of the company's business and of its special problems."

Cox Ferrall, an instructor in the Computer Science Department at the University of San Francisco, comments on the necessary balance of technical and business knowledge: "You can write the most state-of-the-art code, but if it doesn't solve the user's real problem, it's no more than intellectual masturbation."

*Leonard Grzanka is principal of Grzanka Associates, a high-technology product promotion firm in San Francisco.*

In the 11 years since he started a computer consulting and training business in his home, Gopal Kapur, president of the computer training, software development and consulting firm Kapur & Associates in Danville, California, has seen contract programmers

## Clients must perceive quality.

and computer consultants come and go. He observes that contract programmers and consultants often go out of business quickly due to a lack of preparation. "They don't establish the proper contacts before starting the business; they don't know who they're marketing to; they don't plan a marketing strategy, and they haven't established a cold-call technique," he says.

Kapur recommends that people planning to become contract programmers not quit their full-time jobs until they've laid the proper groundwork. This involves several months attending professional data-processing association meetings, talking with the people who hire contract programmers, and learning their needs — all the while building a list of contacts for future work.

Kapur recommends that someone wishing to become a contract programmer first spend six months or more sub-contracting work through a company that brokers temporary programmers. "The experience will help you learn marketing techniques and the pricing structure of the industry," he explains.

That's exactly what Cox Ferrall did several years ago when he "saw the handwriting on the wall while working at a medium-size minicomputer time-sharing firm. The PC and communications technology were surely going to supercede minicomputer technology," he says.

"I initially subcontracted through an established local consulting firm for sources of clients. I felt comfortable using somebody else's security blanket — until I found myself doing the majority of the selling for them. Rather than continuing to give up a large slice of each pie, I launched out on my own."

Both Ferrall and Kapur stress that if you plan to strike out on your own after gaining initial experience at a "job shop," it's very important to establish a

client base independent of the firm for which you're consulting. "Don't take their clients from them," Kapur warns. "It's unethical, and if you do it, you won't stay in business very long. Your references will be bad."

"I call it good manners, not ethics," Kapur says. "But a lack of professional ethics — such as using a client's Xerox, phones, supplies and contacts for your own marketing — will destroy your professional reputation."

Gopal Kapur offers a few more practical tips for those about to start their first ventures: "You should have enough cash to be solvent for at least six months from the time you go into business. People get into financial trouble, their business judgment gets poor, and they tend to say the wrong things to clients. And it takes 40 to 50 days to get your cash flow going after you start on your first job. I recommend you bank with a small neighborhood bank, because they're more attentive and responsive. They recognize your name when someone calls for references, and they're understanding during a short-term crisis. It's too late to shop for a banker when you're in trouble."

## ON-THE-JOB TRAINING

You've gone to a few industry meetings, met and impressed a few data-processing managers, and have finally landed your first independent contract. The experts warn that your performance on every job — especially the first one — will make you or break you in this field. "Clients and prospective clients must perceive quality in everything I deliver," Cox Ferrall said when explaining his marketing strategy.

But you must also know how to handle human dynamics when you're a "highly paid consultant" — as all successful contract programmers agree. "Whenever you talk with a large company, you're going to face the political problems of that company," notes Dr. Abramson. "Human beings often require more delicacy than you need to solve a computer problem."

"Many contract programmers alienate regular employees because they brag about the money they're making," Gopal Kapur observes. "You should always keep the feelings of (the client's) employees in mind." Kapur feels that if the contract programmer hears staff programmers griping about the high contract rates, the contractor should politely explain to them that

*Text continues on page 52*



# Let the Truth be Known



One of your product reviewers, Carl Oppedahl, has inspired me to write my first letter to the editor. Normally a product review is a mixture of objective facts and subjective personal preferences. But I do have to take exception when a reviewer presents subjective perceptions as accomplished facts.

Ironically, the review which I take exception to concerns a competitor's product reviewed in your May issue. In Mr. Oppedahl's review of Super ROM, he mentions the "pin out" problem in the Model 100 and Tandy 200 option ROM socket and states that so far, no vendor has developed a good solution to solving this problem.

Mr. Oppedahl mentions that the rigid circuit board that Super ROM uses can damage the ROM socket and that Traveling Software's Ultimate ROM II uses a "thin and fragile PC board which wraps around the EPROM." He continues saying that the Traveling Software ROM "is degraded by repeated insertions and does not stand up well to abuse when out of the computer."

Mr. Oppedahl is accurate in his assessment of the Super ROM chip concerning the possibility of damaging the Model 100's ROM socket. This fact is well documented and even Radio Shack acknowledges it. I don't take exception with Mr. Oppedahl's statement that our flexible PC board is "thin" and he is more than entitled to his perception that it is "fragile."

I do take strong exception to presenting as an accomplished fact that our "board is degraded by repeated insertions and does not stand up well to abuse when out of the computer." Traveling Software has been shipping ROMs with these boards since July 1985 and Polar Engineering has been doing the same several months before that. There are thousands of these ROMs in use and not a single reported case of a ROM failing because of our flexible circuit board.

The option ROM socket in the Model 100 and Tandy 200 is a patented part manufactured by a company called Molex Inc. of Mountain View, Califor-

nia. It is designed to accept a corresponding Molex chip carrier that mates to the socket with exacting tolerances. Both Traveling Software and Polar Engineering use this part to mount ROM chips that are then wrapped with a flexible circuit board made out of a material called "capton." Since we use the specified part designed by the manufacturer to plug into the ROM socket, there's absolutely no danger of ever damaging your computer's ROM socket.

Traveling Software has rigorously tested the durability of our Tandy ROMs and has successfully installed and removed a single Ultimate ROM well over 2,000 times with no noticeable effects. This same ROM chip has also been repeatedly handled and subjected to general abuse by being carried around in a suit coat pocket for over nine months. This chip still functions just as good as new!

In the future, I suggest that Mr. Oppedahl be more careful in distinguishing between a statement of fact and a given personal perception that has no factual basis. Traveling Software believes it has the best solution for producing ROM software for the Tandy computers, especially for those who desire to frequently install and remove their ROM chips. I would venture to say that the thousands of Ultimate ROM customers would agree.

Mark Eppley  
Traveling Software Inc.

Tom Bennett  
Polar Engineering

## DOS AVAILABLE?

In your November, 1985 issue there is an article reviewing the Tandy disk drive. At the end of the article there was a statement that your magazine was sponsoring the development of a

new operating system that will add complete disk drive control to all of Tandy's portables.

I am considering the purchase of this disk drive and wonder whether the new operating system is anywhere near ready for use.

Penny Montgomery  
Stockton, CA

*When we announced that Portable 100 was designing a public-domain operating system for the Tandy Portable Disk Drive back in November 1985, we didn't realize that several vendors had already assigned programmers to the task. Since we're not a software house to begin with, we didn't think it ethical to offer for free what our advertisers were trying to make a living on. Hence, we decided to put our software development plans on hold. Currently we've seen TS-DOS from Traveling Software, Powr-Disk from Acroatix and Disk Power from Ultra Soft. At this writing, we know the folks at Portable Computer Support Group are also working on their own operating system but it has yet to be formally announced.*

—Ed.

## A LITTLE BIT OF BUGS

While my dog Little Bit and I anxiously await the promised enhanced DOS for the Tandy portable disk drive, I want to thank Portable 100 for the many programs that have made the Model 100 such a pleasure to use. We have three 100s; one on-line as a mini bulletin board, one with the PG Design 64K RAM expansion for correspondence and the checkbook, and a third in case of a headache.

Here are a couple of bugs that Little Bit brought to my attention:

Using the Portable Disk Drive with the phone line plugged in and TELCOM STAT set up for the modem makes the phone come off-hook during disk access. If TELCOM is set up for

*Text continues on page 58*



A Truly  
Integrated Software

NEW! MODEL 100 3-in-1 ROM

# Interactive Solutions\*

All the software that you will ever need  
on the Model 100 Portable:



- 1— Data Base
- 2— Spreadsheet
- 3— Word Processor  
with Mail Merge

Now on a plug-in ROM. *Integrated* and easy as 1-2-3!

## Interactive Solutions

Tandy Cat. #26-3844

Available at your nearest

**Radio Shack**  
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■ **The Data Base** turns your Mod 100 into a personal filing system. You can store, examine, update, select, sort and list a wide variety of information - from personnel records and inventory facts to appointment schedules and client lists.

■ **The Spreadsheet** turns your Mod 100 into a powerful decision tool. It is a full featured spreadsheet with 99x99 cells and provides fast decimal arithmetic in formula computation with complete range of scientific functions.

■ **The Word Processor** uses the Text editor of Mod 100 and gives you additional features for formatting and printing. You can set margins, line/para spacing, justify, define header/footer and use special print features like underline, **boldface**, etc.

**MORE MEMORY** Interactive Solutions does not occupy RAM memory, so frees your precious RAM for larger data files.

**EXTRA CONVENIENCE** Interactive Solutions plugs in the optional ROM socket. It is always resident and ready to work. You don't need to load programs from cassette recorder any more.

**Interactive Solutions integrates** all of your data information in Mod 100. With a touch of a function key, you can easily:

- Select and move items from **Data Base** files into **Spreadsheet** columns.
- Generate a report in **Data Base** program and move to the **Word Processor**.
- Cut any part of **Spreadsheet** and move to the **Word Processor**.
- Merge the items (like names, addresses) from **Data Base** files into a **Form Letter** and generate multiple letters or labels.

*All this and much more in  
a 32K bytes ROM from*

DCM Data Products  
1710, Two Tandy Center  
Fort Worth, Tx. 76102  
Tel: 817/390-2762



\*Copyright DCM Data Products. Licensed to Tandy Corporation

\* Registered trademark of Tandy Corporation.

Radio Shack and Model 100 are trademarks of Tandy Corporation.  
1-2-3 is a trademark of Lotus Corporation.



# And Printers Too

Now computerists can have their printer cake, and eat it too! General Electric, of all companies, has entered the printer market with a product that has all the earmarks of a best seller. Their TXP-1000 printer fulfills nearly all the needs a home or small business user could have. So far, it's gotten little attention from the computer press.

This printer combines some great features; a fine letter-quality font in pica or elite pitches, graphics, almost silent operation, near Epson compatibility, a two year warranty, and it sells for less than \$200!

I recently purchased one for myself, after looking at other low-cost alternatives for several weeks. I was very impressed that an inexpensive unit like this could have such high print quality compared to most other near letter-quality dot-matrix printers on the market.

The TXP-1000 is a thermal-transfer, non-impact, dot-matrix printer with a print head consisting of 16 vertical dots. The unit can use regular paper or thermal, roll, single sheets or fanfold paper up to 9 1/2 inches wide. Although it has the well-known GE name, it's not manufactured in the United States, but in Japan.

The printer weighs in at a light 10 pounds and is about the size of an Epson LX 90 printer. It's enclosed in a sleek two-tone tan case with a smoke colored lid covering the printhead and ribbon cartridge. All of the controls are on the front edge, along with power on/off, online/offline and paper/ribbon lights. Three DIP switches are easily found by lifting the cover; they control the paper end detection, a toggle between 7 or 8 character bits and line-feed. A standard Centronics parallel port is on the back, along with a convenient AC outlet in which to plug other peripherals.

The TXP-1000 is about the most versatile printer I've used. It prints precise block or bit-image graphics, draft quality characters at 50 characters per second (cps) and near letter-quality print at 25 cps, both with true lower-case descenders.

All printing can have various densi-

ties, (i.e. lightness or darkness) just by sliding a control on the front panel. The darkest print is a nice deep black tone, which gives it a true daisywheel look not found on regular impact dot-matrix printers.

The printer comes with five international character sets including French, German, Italian, English and Danish as well as 31 scientific characters. Also available are underlining, variable character pitch and line spacing, hori-

## TXP-1000

Dot-matrix printer  
Model No. 3-8100

General Electric  
Company  
(800) 626-2000  
or (315) 456-0123,

Price: \$200

Circle No. 151

zontal/vertical tabs, microtabs and superscripts/subscripts. Compressed and elongated print modes are both supported in either pica or elite type. When using the compressed elite mode, up to 192 characters per line can be printed, which is great for big spreadsheets. Another feature most appreciated for home use is its nearly silent operation.

## STILL NOT PERFECT

Are there any drawbacks to the TXP-1000? Yes, there are a few. For instance, boldfacing is not included except by the slide control on the front. Also, there are no sprockets for fan-fold paper. The friction type platen does a fine job of holding most paper straight but you still need to watch for slippage, especially when using narrow fan-fold labels.

The TXP 1000 doesn't print bi-directionally, as most current dot-matrix printers do, which reduces its throughput somewhat. The ribbons used are a one-pass only transfer type and they don't seem to last too long, although the manual says they last



10,000 characters.

The bit-image graphic mode doesn't seem to be totally Epson compatible. Using it to output graphics from my system yielded a good image, but with horizontal spaces dividing up the picture. Apparently the TXP 1000 tends to put linefeeds into the graphics.

## GOOD SUPPORT

The TXP's manual is clear and easy to follow. But if you have any problems or questions, General Electric also provides a toll-free Answer Line (800) 626-2000. I called with some questions about Epson compatibility and the size of the memory buffer. Although the woman who answered didn't have the answers, she referred them to a specialist who called me at work a few days later. He told me the printer is Epson compatible and it has a two kilobyte memory buffer.

General Electric offers the longest warranty period for a printer — a full two years. If you run into trouble, call the Answer Line to find out where to send it for repair or replacement.

The TXP 1000 is not generally sold through mail order dealers, but is usually found at department and discount stores for less than \$200.

This great little printer does lack some of the capabilities of the more expensive models, but it's more than adequate for most jobs in the home or small businesses. It may be the underdog in the printer world, but it has the GE name; something to consider when browsing around the shadowy low-cost printer world. The TXP does more than its share of work for the price, and with style. I recommend it.

— Jeff G. Rottman



# Print Buffer Bonanza

**Y**ou've had it happen to you before. You've got a file on your portable you want to print out. But it'll take a good 30 minutes and you don't want to tie up your computer for so long. It would be so much more productive if you could be working on something else while the file is printing. But the computer doesn't work that way. So you live with the limitation.

Your experience is not unique. To curb frustration, several companies have come to the rescue with products called print buffers. Essentially these magic boxes intercept and store your print file and codes before sending them to the printer.

Since it's printer speed that slows the print process down, transmission between computer and buffer is relatively fast. Once transmitted, the computer assumes the file has been printed and is ready to go on to another task. In the case of your portable, you could even disconnect it from the buffer leaving the file to print unattended.

Here are some print buffers that have recently been announced...

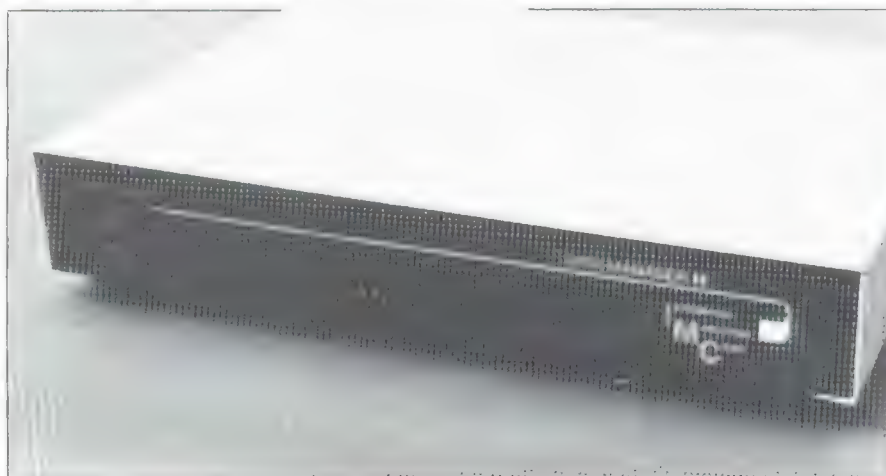
## ...It's Better to Look Good

From Black Box Corporation comes an alternative to expensive letter-quality printers. The NLQ Print Buffer is a microprocessor controlled unit that allows any Epson FX or RX printer with a Centronics interface to produce near letter quality type in a variety of print styles including Courier, Prestige, Elite, Italics and Roman.

The NLQ is equipped with a 128K buffer for storing text. Additionally, it provides a number of word processing functions through the use of control codes.

The NLQ Print Buffer is available for \$269 from Black Box Corporation, P.O. Box 12800, Pittsburg, PA 15241-9980, (412) 746-5530.

Circle No. 81



## ...Printer Sharing

Up to four computers can share one printer with the Data Manager II from Integrated Marketing Corp. The unit comes with 64K of buffer memory.

Data Manager II performs the "print sharing" tasks automatically. It allows one printer to service multiple files in both real time (single page) and delayed queueing (multiple pages).

Data Manager II constantly checks each connected computer to see if it is

sending data to the printer. Each computer is given a fixed allocation of two pages for use in an "immediate mode" that can be expanded to 17 pages.

The unit comes with its own power supply and requires no maintenance. It sells for \$595. Contact Integrated Marketing Corp., 731 East Duane Ave., Suite H, Sunnyvale, CA 94086, (408) 730-1112.

Circle No. 82



## ...Roger RAMJET

Omnitronix, Inc. has introduced the RAMJET 256K Print Buffer that comes with a full 256K of buffer memory. The unit comes in either serial or parallel versions.

The RAMJET has many features including a pause mode for using sin-

gle sheets of paper when printing.

The unit is covered by a two year warranty. The suggested list price is \$269. Contact Omnitronix Inc., P.O. Box 43, Mercer Island, WA, (206) 236-2983.

Circle No. 83



3620 - 244 Street, Langley, B.C. V3A 4P6 Telephone 604-534-6441

## Hardware, Software, Accessories

No more hassles with customs clearance

Write or phone for free price list

VISA ~ Master Charge

A service for Canadian users of:

TRS Model 100, Olivetti M10, NEC PC8201A

**Canada Portable Computer****NEW MASS STORAGE SYSTEM  
FOR ONLY \$89.95****GREAT PERFORMANCE — INCREDIBLE PRICE**

A&J Micro Drive would like to announce its new portable System 100. This mass storage system, designed for the Radio Shack Model 100, offers high speed storage for the price of a cassette.

The System 100, with electronics and software designed by A&J Micro Drive, uses the latest Micro Wafer Technology developed by Entrepo Inc. The new system combines high speed digital electronics with low cost, high performance Micro Drive Technology.

**INTERESTED . . .**

The 100's compact operating system is smaller than that of the Radio Shack Disk Drive. The latest release of the operating system may be down loaded by calling the computer at A&J Micro Drive using the simple instructions included with the unit.

The System 100 may be small enough to fit into a corner of your briefcase and require only 4 "AA"-size batteries for months of use — but don't be fooled, our new unit is packed with state-of-the-art electronics. It will give you ultra reliable program loading as fast as the disk, and twenty times faster than the cassette.

The System 100 uses a miniature endless loop tape cartridge called a Micro Wafer. The Micro Wafer, approximately the size of a credit card, is completely enclosed in a protective housing. A built-in cover retracts as the tape is inserted into the drive, exposing the video-grade digital magnetic tape to the read/write head. Micro Wafers come in several lengths, allowing the customer to choose the length best suited to his application.

**STILL INTERESTED**

The price of \$89.95 includes a drive system with cable attached, one Micro Wafer, operating instructions and one-year membership to the A&J Bulletin Board.

**Manufacturer's Specifications**

System 100  
A&J Micro Drive  
1050 E. Duane Ave. Ste "J"  
Sunnyvale, CA 94086  
(408) 732-9292

**Price: \$89.95**

Baud Rate: 14,000 bits/second  
Tape Speed: 10 inches/second  
Capacity: 1.5K bytes/foot tape

10' = 15K bytes

62' = 100 K bytes

Lengths: 10, 20, 35, 50, &amp; 62'

Power Supply: 4 "AA" cells

Connection: Uses RS-232 port

Cable: 30 inch RS-232 attached

Size: 6 x 4 x 2.5 inches

Weight: 24 ounces

**NEW PRODUCTS****Joy Without a Stick**

Prime Marketing has introduced two competitive game programs for the Tandy portables.

Hangman is a word guessing game. One player selects a word and another tries to guess it one letter at a time.

Football Pool is used to manage bets on the total score of both teams in a football game. Used before or during the game, it reviews players' numbers and predicts the next winner. It also displays the current score and other game statistics.

Both games are available for the Model 100 or Tandy 200. Hangman sells for \$9.50 and Football Pool is \$12.00. Contact Prime Marketing, 807 Steward Lane, West Chester, PA 19382.

Circle No. 86

**Since it's in This Issue**

Assuming Mike Nugent's article may have piqued your curiosity, more information on the Dvorak keyboard is available in a book of the same name published by Freelance Communications.

*The Dvorak Keyboard* by Randy Cassingham answers the many questions typists, schools and managers have had about the Dvorak. "With the demands of productivity and the need for basic typing skills now that computers are commonplace, the more efficient and easier-to-learn Dvorak will eventually replace the Qwerty (keyboard) entirely," says Cassingham.

*The Dvorak Keyboard* is available for \$12.95 (plus \$1 shipping) directly from the publisher or through bookstores. Contact Freelance Communications, P.O. Box 717, Arcata, CA 95521.

Circle No. 84

**Some Old, Some New**

Yet another operating system for the Tandy Portable Disk Drive. This one's from UltraSoft and features cursor driven RAM and disk directories, mul-







# USE YOUR DESKTOP COMPUTER AS A DISK DRIVE FOR YOUR M-100.

New-  
IBM, MS-DOS  
version works  
over the phone!

# Disk +

on Snap-In™ ROM



## Try Disk + for 30 days. If you aren't as excited as we are, return it for a full refund.

When we designed *Disk +* we did it out of necessity. We wanted a way that we could just connect a Model 100 to our desktop computer with a cable and save files onto the desktop's disk drive. We wanted it to be so simple to use it would be self-explanatory.

Picture this. *Disk +* comes to you on a Snap-in ROM and a diskette for your desktop. You take a quarter and open the little compartment on the back of your Model 100. Then you just press the ROM into the socket. *Disk +* appears on your main menu just like a built-in.

You connect your Model 100 to your other computer using an RS232 cable (available from PCSG for \$40).

You just place the *Disk +* diskette into the desktop's drive and turn on the computer. It powers up automatically and says "awaiting command" on your desktop's screen. Then you just put the widebar cursor on the Model 100 main menu on *Disk +* and press ENTER. You are shown your RAM files arranged just like the main menu.

To save a file to your other system's disk drive, you just move the widebar cursor to the file you want to save and press ENTER. It is saved instantly with no further action.

To look at the disk directory, you just press a function key on your Model 100. You see immediately the disk directory on your Model 100 screen, and it is arranged just like your Model 100's main menu.

To load a file from the diskette to your Model 100, you just move the widebar cursor to the file and press ENTER. The file is transferred to your Model 100's RAM instantly. You can press F8 and go back to the main menu, and the file you loaded from diskette is there, ready to use.

It is so nice to be able to keep your documents, programs (both BASIC and machine code) and *Lucid* spreadsheet files on the diskette, and bring them back when you need them. All files are ready to run or use with no changes or protocol by you.

**If you have access to a desktop computer and don't have *Disk +*, then evidently we have done a poor job telling you about it.**

All files and programs that you load or save, go over and come back exactly as they are supposed to be because of full error checking. This guaranteed integrity is really a comfort. *Disk +* is wonderful in so many other ways. For example, you can do a "save all" of all your RAM files with just a touch of a function key. That group of files is saved on the diskette under a single filename with a .SD (for subdirectory) extension. Any time you want, you can bring back all those files at once, or just one or two if you like, again with one-button ease.

*Disk +* takes up no RAM. That's zero bytes either for storing the program or for operating overhead.

What really excites most *Disk +* users is text file cross compatibility. Your Model 100's text files are usable on your desktop computer, and your desktop's text files become Model 100 text files.

This means you can write something on your Model 100, and with *Disk +* transfer it

instantly to your desktop and start using it right away on your bigger computer. Or the way we like to work is to type in a document on the desktop computer and then transfer it to our Model 100 with *Disk +*. Then we print out the document, beautifully formatted, using WRITE ROM.

*Disk +* works with just about every micro sold, from IBM PC and its clones, to all Radio Shack computers (yes, all), to Apple II, Kaypro, Epson and most CPM. Just ask us. More than likely, your computer is supported.

Incidentally, hundreds of Model 100 owners have gone to their Radio Shack stores and bought a color computer because it is so low priced, and with *Disk +* they have an inexpensive disk drive.

And if that weren't enough, how about this: *Disk +* also provides cross-compatibility between different computers like IBM, Apple or the Model 4 using the Model 100 as the intermediary device. Quite a feature!

The snap-in ROM is really great because you can use other ROMs like *Lucid* or WRITE ROM. They snap in and out as easily as an Atari game cartridge and you never lose your files in RAM.

Anyone who ever uses *Disk +* simply can't do without it. But so many times we have had new users call us and say, "Wow! I had no idea when I ordered it that *Disk +* would be so fantastic. I just couldn't believe that I could use my desktop computer's disk drive with my Model 100 just like it is another main menu."

That's why we sell *Disk +* on a thirty-day trial. If you aren't completely satisfied, return it within thirty days for a full refund. Priced at \$149.95 on Snap-in ROM. MasterCard, Visa or COD.

## 1-214-351-0564

## PORTABLE COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd., #207, Dallas, Texas 75229 • 1(214) 351-0564

PCSG provides hotline software support for the Model 100. Call us at 1-214-351-0564

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Circle 36 on Reader Service Card



# Getting a Handle on Reality

*A marketing report that compares estimated and actual production by week, by month and by customer.*

By G.N. Gilbert

The objective behind this article is to provide a quick and easy spreadsheet format to allow readers to compare a monthly production schedule against actual quantity produced. The spreadsheet shown here consumes about 14 kilobytes (K) of memory and provides a monthly comparison between orders received and orders shipped by individual customers for a 12-month period.

The spreadsheet also displays the total dollar amount of orders in-house (both past and present) within the given time frame. Shipments over the same period are totaled, and a summary of weekly activity during the month is shown. Another block provides total orders for each customer and the percent that each represents of our total projected sales to date. This is not printed as part of our initial report.

Some readers will have different ideas on how to set up this spreadsheet. This article is not meant to imply that this is the *only* way; it is just provided as one model that works.

We'll be designing a master form, which we'll want to save intact. Once you've added data to it, you can give it a new name and save it on two separate disks (or cassettes). Backing up files twice may seem like an additional expense, but the time you put into building your spreadsheet is far more valuable.

## HEADING SETUP

To begin our spreadsheet we'll need to establish our headings for each of the columns. Because we're going to compare orders to shipments for a particular month, we'll need two columns per month.

By adding a Customer column we'll have a total of 25 columns. That's

*This is the second in a series of articles about using Lucid in business. Next month, we'll look at bills of materials, as well as product costing and requirements planning.*

INV DATE	CUSTOMER NO.	CODE	SALES
01/05/86	CUST 1	11	55.00
01/10/86	CUST 2	22	35.00
04/10/86	CUST 2	22	8.40
650	59634	3	0.36
2250	3210	28	0.5
261923	264423	2	1.5
21073	2383	1	1.5
14360	2050	5	1.5
5200	0888	1	1.5
1911	3704	0	1.5
3704	0813	3704	1.5

obviously too many for an 8.5-inch piece of paper, even if we used condensed print. We could, however, lay out the first half of the year in one section, and directly below that lay out the remaining six months.

For the sake of this article, we'll assume our customer list is small. A customer column typically should be 20 characters wide, and the monthly columns can be limited to nine characters if we work only with integers for our shipment dollars.

To use integer values you'll need to change the global default to zero decimal places. The Lucid manual explains this in detail. You shouldn't concern yourself with decimal accuracy at this point; we're just doing a management report, not a financial record.

Widen column A to 20 characters and type in "Customer" in A2. In B1 type in "JAN." (Remember you can center text within a column by preceding it with a caret.) Type "Forecast" in B2. In C1, type "JAN" and in C2 put SHIPMENT. Repeat this procedure for each month through June. This should take you to column M.

Back at A1, type in lower case letters the name you'll use to save this report. Because column A is 20 characters wide, we can move over nine spaces before typing your initials (as the designer of the spreadsheet), a slash mark, and then the initials of the person who will be using the report.

## GIVE IT A TITLE

Now we're ready to key in the title of our report. The center of our report is the 64th character. The first line of our title will be YOUR COMPANY NAME, which is 17 characters long. Half of that is roughly nine, so subtract nine from 64 to get 55. YOUR COMPANY NAME therefore begins in the next-to-the-last character of column E2.

The second line of our title will be "Marketing Orders/Shipment." By calculating the same way, we find this second heading will start in the third character of column E3. (Assuming column A is 20 characters wide and the remaining columns are nine wide.) The center is located in the next to the last character of column F.

Move to A3, tap the space bar 14 times, and type "MONTH:." In B3, type in the name of the current month using three letters. The reason for this is that B3 changes from month to month as we use it later in our report, while A3 remains constant.

This report will be updated every Friday, so we will need a spot for that date. Therefore, go to A5 and tap the space bar 11 times and type "Week end:." Move to B5, press Edit (Function Key F1), and then Control D for the current date. In row six, type in a row of

GRAPHIC BY ELIZABETH MARITATO



## Get Organized

The writing is on the electronic wall! If you've watched Compuserve's bulletin board for Model 100 users, you've seen these comments about TMPC, a program to manage "The Most Precious Commodity":

"TMPC is a unique approach to scheduling appointments and to-do's ... it is a superior product ... I have come to rely on it heavily ... and recommend it to anyone who really wants to use the M100 as a time management tool."

— Frank Rytell

"The silly thing actually improved my life! ... Deadlines used to be a real weakness of mine."

— Tim Peters

"I was shocked to find such a fine, professionally produced, well written manual accompanying a \$50 product."

— Bob Willard

"TMPC does indeed help me manage a **very** complicated schedule as a free-lance writer.... With my future spread out before me, it's hard **not** to plan."

— Greg Sandow

"To my mind, the best thought out program for the Model 100."

— Alex Jacobs

Isn't it about time you changed your life — for the better? Order TMPC today, or call or write for more information.

**TMPC** by Ac'rōā'tix  
\$49.95 + \$3.00 Shipping

Acroatrix Incorporated  
P.O. Box 273  
Wilmington, MA 01887  
(617) 658-5550

Toll-free Order Line:

**1-800-225-5800**

*mark									
MONTH: JAN									
Week end: JAN 29, 1986									
	JAN	JAN	FEB	FEB					
Customer	Forecast	SHIPMENT	Forecast	SHIPMENT	Forecast	SHIPMENT	Forecast	SHIPMENT	Forecast
COMPANY A	400	400	200						
COMPANY B	500	500	100						
	900	900	300	0					
	JUL	JUL	AUG	AUG					
Customer	Forecast	SHIPMENT	Forecast	SHIPMENT	Forecast	SHIPMENT	Forecast	SHIPMENT	Forecast
COMPANY A									
COMPANY B									
COMPANY C									
	0	0	0	0					

An example of a marketing report showing forecast and shipments by month.

equal marks (=) from column A to column M. Directly below our column headings, in row nine, type in a row of dashes (-) from column A to column M.

### SETTING UP THE BODY

This portion of the report is actually the simplest part. Just drop down

: YTD SUMMARY:									
: FORECAST:									
: 1ST HALF 395730									
: 2ND HALF 19847									
: Y.T.D. 415577									
: SHIPMENTS:									
: 1ST HALF 161163									
: 2ND HALF 0									
: Y.T.D. 161163									

Year to date summary of total forecasted sales for year and shipments to date.

enough lines for each of your customers, (20 lines, in our example) add one more, and type equal marks (=) across the row from column A to column M again.

In the row just below this, total each

column from A to M with the formula +SUM(B10:B30). If later you need to add more rows, insert them anywhere between the two designated cell numbers you are summing; this way, the formulas will change automatically to include the new rows.

For each week of the month, orders received will be typed in the appropriate customer row and in the Forecast column in which the order is expected to ship. As time goes by you'll most likely receive more than one order from the same customer that is expected to ship in the same month. In our example we are not interested in individual orders, only the total dollars per customer.

To illustrate: In January, Customer A sent you an order to ship \$519 worth of goods in the month of March. Move the cursor to the Customer A row, and across to the March Forecast column. Type in 519. In February, the same customer sends an order for \$468 for delivery in March. Move to the Customer A row, across to March Forecast column and press the Function Key F1 for Edit. The cursor will be in the next available space so all you have to type is +468 and press Enter.

The design for the second half of the year is the same as above, with only the names of the months changing. Just



NAME  
Shipments

MAR	APR	APR	MAY	MAY	JUN	JUN
SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast
0	0	0	0	0	0	0
SEP	OCT	OCT	NOV	NOV	DEC	DEC
SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast	SHIPMENT Forecast
0	0	0	0	0	0	0

repeat everything from row six to nine beginning in row 35. Don't forget to add the formulas to total the columns.

#### CUSTOMER YEARLY SALES

We will need to add a few more columns in order to get our yearly sales figures by customer. Move the cursor to N1 so you can widen column N to 20 characters. We are going to use columns N through R to total our customer orders. In column N, row 2, center our title "Yearly Sales Totals."

Extend the equal marks in row six to include column R. Title column N as "Customer," column O as "First Half," column P as "Second Half," column Q as "Total," and column R as "%." The dash (-) in row nine needs to be extended to column R also.

Starting in column N10, type in +A10 through to the end of your customer list. Now whenever you type in a new customer name in column A, column N will be updated automatically. Column O is the total of all the Forecast columns for the first six months. This is handled with the formula:

$+(B10+D10+F10+H10+J10+L10).$

This formula must be repeated down

the column to end your customer list. A similar formula is then used in column P for the second half. Assuming your first data row for the second half is Row 39, the formula, beginning in P10, would be as follows:

$+(B39+D39+F39+H39+L39).$

Column Q is a total of columns O and P:  $+(O10+P10)$ . At the end of the customer list, be sure to total the Q column. The percentage in column R is found with the formula:

$+(Q10/Q32)*100$

(where Q32 is the total of column Q; remember to keep Q32 constant as you replicate the formula down column R.) In other words, in R10 the formula is  $(Q10/Q32)*100$ ; in R11, the formula is  $+(Q11/Q32)*100$ . This particular portion of the report is then printed whenever you want to know how much each customer is ordering from you and what percentage each represents of your total sales dollars.

#### WEEKLY BACKLOG BLOCK

After you've completed the second half of the year portion, drop down two

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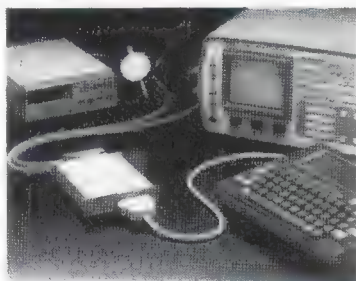
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## SPREADSHEET

more rows or to row A70. Type equal marks (=) from column A to column G. At row 71, center "YOUR COMPANY NAME," and on the next line down, center "Month to Date." It's time to use the month we input in B3, so move the cursor to A73 and type in the formula +B3. Just below this row, replicate the equal marks (=) across the columns from A to G. Table 1 details the remaining column headings.

A75	WEEK NO.	F76	NOT B/L
B75	BEGIN.	G76	BACKLOG
C75	ORDERS	A78	1
D75	ORDER ADJ	A80	2
E75	SHPMNTS	A82	3
F75	O/S	A84	4
G75	NEW	A86	5
B76	BACKLOG		

Table 1: Column headings for weekly backlog block.

In Rows 77, 79, 81, 83, 85 and 87, type in a row of dashes (-) from column A to G. The Beginning Backlog data for week one comes from the previous month's report. You must key this in, because this report is constantly changing.

The information for each week comes from our order entry clerk and our shipping department. As the orders are received or shipped, they're recorded on a form and sent to the marketing department on a daily basis. They're accumulated during the week and the Marketing Report is then

updated on Friday afternoon. The orders column represents the orders received during this week.

The order adjustment column allows us to handle increases or decreases for existing orders; for example, cancellations or add ons. The shipment column tells us what was shipped this week. The sixth column is for overshipments not in the Backlog. The formula for the New Backlog in column G is simply +(B78+C78+D78-E78). Notice that column F is not included in the formula. The Beginning Backlog for week two is +G78. The same logic follows through to week five. In other words, the Beginning Backlog is always plus (+) the G column and then row number of the previous week. To have a running total of how we're doing this month, we need to sum the middle four columns using the formula +SUM(C78:C86) in column C, +SUM(D78:D86) in column D, and so on. This block could then be printed separately if you so desired.

## YEAR TO DATE SUMMARY BLOCK

Now we know how we are doing monthly and weekly within the current month. But we want to know a summary of our total forecasted sales for the year based on orders in-house, and our shipments for the year thus far. Part of this information is available in the total line in the Yearly Sales figures stated above. However, we will re-

YOUR COMPANY NAME						
MONTH TO DATE						
Month of: JAN						
WEEK NO.	BEGIN. BACKLOG	ORDERS	ORDER ADJ	SHPMNTS	O/S NOT B/L	NEW BACKLOG
1	409093	18506	-1200	8597		417892
2	417892	216400	7682	21085		620799
3	620799	1750	-5400	15724		601425
4	601425					601425
5	601425					601425
		236656	1082	45406	0	

Weekly backlog report.



Yearly Sales Total

Customer	1st Half	2nd Half	Total	%
COMPANY 1	600	650	1250	0.14
COMPANY 2	0	59634	59634	6.68
COMPANY 3	960	2250	3210	0.36
COMPANY 4	2500	261923	264423	29.25
COMPANY 5	150	21073	21223	2.35
COMPANY 6	54221	14360	68581	7.59
COMPANY 7	8533	5299	13832	1.53
COMPANY 8	27932	19118	47050	5.20
COMPANY 9	9384	3704	13088	1.45
COMPANY 10	0	132913	3704	0.41
COMPANY 11	9600	24756	34356	3.80
COMPANY 12	2992	50	3042	0.34
COMPANY 13	91595	100	91695	10.14
COMPANY 14	0	300	300	0.03
COMPANY 15	56528	1020	57528	6.36
COMPANY 16	6256	3870	10126	1.12
COMPANY 17	9328	5099	14427	1.60
COMPANY 18	0	1600	1600	0.18
COMPANY 19	30478	21678	52156	5.77
COMPANY 20	142729	0	142729	15.79
	453786	579378	903954	100.00

Yearly sales totals by customer.

develop the formula here because some people might consider that block optional.

To obtain this information, we will need to add another short block. Move the cursor to H73. Tap the space bar seven times and type equal marks in columns I73 and J73. In K73, key in equal signs preceded by a quote mark ("="). In column H, rows 74 through 84, tap the space bar seven times and type a colon (:). Next, repeat in row 85 the same process stated for row 73. In column K, rows 74 through 84, type in a colon preceded by a space (:). Now let's fill this block we just created. For the titles, see Table 2.

I74	YTD SUMMARY:
I76	FORECAST:
I77	1ST HALF
I78	2ND HALF
I79	Y.T.D.
I81	SHIPMENTS
I82	1ST HALF
I83	2ND HALF
I84	Y.T.D.

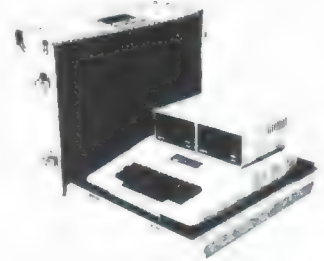
Table 2: Column headings for the year-to-date summary block.

The formula for J77 is:  $+(B32+D32+F32+H32+J32+L32)$ . This formula totals all the Forecast columns for the first half of the year. Do the same for the second half Forecast column and both Shipment columns. The Forecast columns are B, D, F, H, J and L, and the shipments columns are C, E, G, I, K and M. You'll have to insert your own row numbers. The year-to-date totals are simply the sum of the two halves.

Remember to go back and protect each of the cells that do not require input. This is just an added precaution so someone doesn't inadvertently key data in a cell with a formula.

In this spreadsheet, we spent most of the time on the layout, so the formulas were somewhat easy. It's important to remember when you design a spreadsheet report that it be well laid out, easy to read and that it includes everything needed to understand the contents. And finally, if some of the information will be needed by other people, it's a good idea to structure the report so that someone can print that data only, even if it means duplicating some of the title information. □

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WRITE ROM — as its name implies — is on a snap-in ROM. You simply open the little compartment on the back of the Model 100 with a quarter and press WRITE ROM in. It's as easy as an Atari game cartridge. You can use other ROM programs like Lucid whenever you wish.

WRITE ROM lets you do every formatting function you'd expect, like setting margins, centering, right justifying and creating headers and footers. But it does them under function key control.

WRITE ROM remembers your favorite format settings so you can print a document without any setup, but you can change any formatting or printing parameter instantly with a function key.

WRITE ROM's "pixel mapping" feature shows you an instant picture on the screen of how your printout will look on paper.

In all there are 64 separate features and functions you can do with WRITE ROM, and some of these features are truly breakthroughs for the Model 100.

First, WRITE ROM lets you do search and replace. Any word or phrase in a document can be searched for and replaced with any other phrase where the search words appear.

Second, WRITE ROM lets you send any text (formatted or not) to any other computer over the phone with just a function key. What's more, it dials and handles sign-on and sign-off protocol automatically.

Third, WRITE ROM has a wonderful feature called Library that lets you record favorite phrases, words or commonly used expressions (often called boilerplate).

Any place you wish Library text to appear you just type a code. WRITE ROM automatically inserts the text just like a Xerox Memory Writer. Picture what you can do with that kind of capability.

WRITE ROM is blindingly fast. No one can claim faster operation. Because it is on ROM it uses virtually none of your precious RAM. It works with any printer, serial or parallel. You can make a duplicate copy of a document file under a new filename. Rename or delete (kill) any RAM file with function key ease.

This description only scratches the surface of this amazingly powerful piece of software. Dot commands allow control of such things as margins, centering, line spacing and other changes in the middle of a document. Most are WordStar™ compatible.

A mailmerge feature allows you to send the same document to every name on your mailing list, personalized for each recipient.

WRITE ROM enables you to do underlining, boldface and correspondence mode as well as any other font feature like superscripts that your printer supports, in a way that many users say "is worth the price of the program."

To underline you don't have to remember a complicated printer code. You just type CODE u, and to stop underline, CODE u again. The CODE key is to the right of your spacebar. Boldface? CODE b to start and stop. Easy to remember and do. Five different printer features of your choice.

We couldn't list all the features here. For example, you can select not just double space but triple or any other. You can use your TAB

key in a document. WRITE ROM allows you to indent. This means you can have paragraphs with a first line projecting to the left of the rest of the paragraph. WRITE ROM has a feature unique for any word processor on any computer. It's called FORM. FORM is an interactive mechanism that lets you create screen prompts so that you or someone else can answer them to fill out forms or questionnaires.

With FORM, any place that you had previously typed a GRAPH T and a prompt in a document, WRITE ROM will stop and show you that prompt on the screen. You can type in directly on the screen and when you press F8 you see the next prompt. It goes to a printer or a RAM file.

Think how you can use FORM. A doctor or nurse could use it for a patient's history with each question appearing on the screen. An insurance salesman could use it for his entire questionnaire. You could construct a series of prompts to answer correspondence, typing the answers, even using Library codes. This feature lets you answer letters in rapid-fire fashion, each with personalized or standard responses.

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# Behind the Screens of Your Portable

*The fine art of using screen control codes on your Model 100, Tandy 200 or NEC 8201.*

By James R. Avoli

The liquid-crystal display on portable computers is smarter than you might think. In the past, we may not have considered it very effective for aesthetic output, but there are simple control codes that allow the screen to be software controlled for making our programs more visually pleasing.

These special codes won't be found in the 100's owner's manual, but are buried on page 80 of its technical reference manual under the heading "LCD Functions and Escape Codes." They're found more easily in chapter eight of the NEC 8201 owner's manual.

For my own software, I've made these codes easy to use by creating the BASIC source code shown in the accompanying listing. I saved it as a text (.DO) file directly out of BASIC with the command:

SAVE "LCDCTL", A

You may use whatever file name you choose that has not been used already; it's not critical. These lines of code can be merged at the beginning of every new program, so there's no need to look them up or memorize them. When they're already established in your program, you'll be tempted to use them more often.

Obviously, these aren't all of the control codes, but they're the ones that get used the most. There's no need to insert or delete a whole line, to move the cursor one position in any direction, to display the function keys, or to disable or enable scrolling. You can include them if you like, but remember that they not only take up memory in the file, but also in every BASIC program into which they're merged.

All the codes in the listing have good, everyday uses. For example, besides its use in most of the control codes, I like to use ES\$ (the ESC key) as a blind QUIT option when I have any keyboard decision pending:



```
100 IS="" THEN 100
ELSE IF IS=ES$ THEN STOP
ELSE PRINT IS;
```

Additionally, although the CLS command is understood universally and is easy enough to use, it's more efficient to use a simple variable CS\$

within the same PRINT command than to precede the PRINT command with a separate CLS.

When a keyboard entry fails its validity tests, CL\$ blanks out the bad data on the prompt line, and CN\$ guarantees a blinking cursor for the INKEY\$ function:



A screen control program for the Model 100, Tandy 200 and NEC 8201.

```

1 REM ... "PRGNAM.BA"
2 REM ... last revised: mm/dd/yy
3 REM ... by James R. Avoli, C.D.P.
4 REM ... comments go here
5 ES$=CHR$(27): REM ... <ESC> escape
6 WB$=ES$+"p": REM ... White-on-black
7 BW$=ES$+"q": REM ... Black-on-white
8 CN$=ES$+"P": REM ... Cursor on
9 EL$=ES$+"I": REM ... Erase cursor's entire line
10 CL$=ES$+"K": REM ... Clear to end of cursor's line
11 CD$=ES$+"J": REM ... Clear to end of display
12 CS$=ES$+"E": REM ... (CLS) Clear screen
13 BL$=CHR$(7): REM ... sound the bell
    
```

## Screen Control Codes for the Model 100, Tandy 200 and NEC 8201

<ESC> +	CHAR\$(27) +CHR\$(##)	MEANING/ FUNCTION
j	106	Clear Screen
I	108	Erase cursor's entire line
P	112	Reverse video
q	113	Normal video
A	65	Move cursor up 1 line
B	66	Move cursor down 1 line
C	67	Move cursor right 1 column
D	68	Move cursor left 1 column
E	29	Clear screen & HOME cursor
J	74	Erase from cursor to end of display
K	75	Erase from cursor to end of line
L	76	Insert from a line
M	77	Delete cursor's line
P	80	Display cursor
Q	81	Erase cursor
T	84	Display function keys
U	85	Erase function keys
V	86	Inhibit scrolling
W	87	Enable scrolling
Y	x,y	Position the cursor at the location codes computed for X and Y.

Note that the last item is difficult to implement because it codes for row and column locations, not the actual location addresses. Therefore, it's much easier to use the PRINT@ command, and let BASIC do all the computational work for you.

```

100 PRINT@120,"Continue with
    default
    of ";X;"(Y/N)? ";CL$;CN$; :IS$=""
200 IS$=INKEY$
    :IF IS$="" THEN 200
    ELSE IF IS$=ES$ THEN STOP
    ELSE PRINT IS$;
300 IF IS$="Y" OR IS$="Y" THEN 600
400 IF IS$="N" OR IS$="N" THEN 500
    ELSE BEEP
    :GOTO 100
    
```

It's a big advantage to highlight important text or data as part of the prompt, and reversing the colors is a simple task when you already have the means established to insert the reverse and normal control codes:

```

100 PRINT@120,"Continue with
    default of"; WB$; X; BW$;"(Y/N)? ";
    CL$; CN$;
    :IS$=""
    
```

It's also a nice touch to plant the date and time in a "standard" heading subroutine for each screen:

```

5000 SCREEN 0,0
    :PRINT CS$;WB$;TAB(14);
    "Program Title";TAB(40);DATE$
    " @ ";TIME$" J. Avoli
    <ESC>-QUIT";BW$;BL$ : RETURN
    
```

Note that in this instance, it's more efficient to add BL\$ to the PRINT command than it is to tack a separate BEEP command onto the end.

For those less-used control codes, a complete list is given in the accompanying table. Keep in mind that most of today's computers and modern display terminals use this type of control code mechanism. Except for the complex X,Y position codes (I've been told that this is one of the less famous ANSI standards), they're almost guaranteed to be different for each manufacturer; the Tandy and NEC machines are the exception to this rule. Even so, all you have to do is edit a clone of this source code to match the codes of whatever computer or terminal that you're going to use, and you can transport this technique to any version of BASIC to run on any computer to support any display device.

So there you have it — easy enhancements of displays in all your programs if you begin each new program with the immediate command:

MERGE "LCDCTL

or whatever file name you used. Good luck!□



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A C Condensed	A G Near Letter Quality	12 cpi	A W Wide/Extended
A D Double Strike	A H Super Script		A N Microfont
A E Elite	A L Sub Script		A R Red or Italics

1.42 CHUGO  
Apr 28, 1986 Mon 21:35:07  
**TEXT POWER 100**  
© Copyright 1985 Hugo Ferreira  
Done Left PageL PageR TopM BotM Rly Stp

Pass	Page	
1	1	
TOP	TEXT	BOTT.
5	58	3
2/12/20		

[illegible]

```
#####And so John, I would recommend
NEXTPOWER$100 as the best
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00 and the new TANDY$102.
```

Pass	Page	TOP	TEXT	BOTT.
1	1	4	57	5

R/D/P/D

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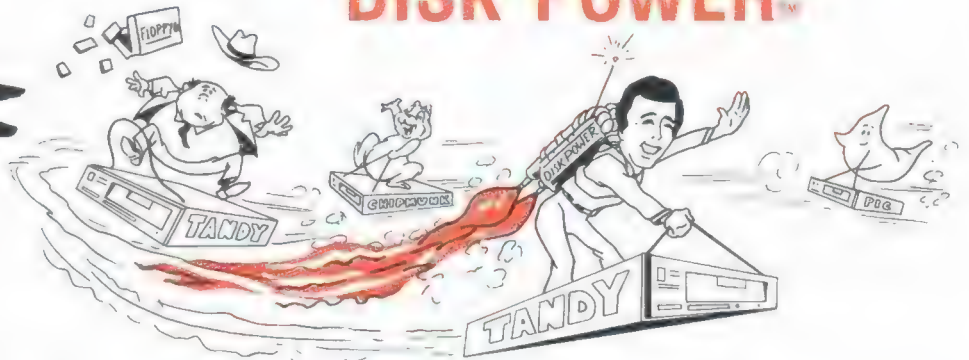
### • DISPLAY FEATURE

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- PROGRAM FLOW is even more consistent for all functions, with vital parameters displayed after each page.
- PASS COUNTER implemented to help recognize which copy is being processed when merge is in use.
- DOUBLE SPACE now selected as an "in file" command to turn the feature ON or OFF anywhere during printing.
- FOOTER & HEADER handling is simplified & easier to use.
- "Plot" is improved and now shows page boundaries when there is room on the screen.
- (.DO) files only are listed when entering any function, with a default filename proposed to save typing.
- START & STOP file processing anywhere within the text, using this embedded command.
- LINE FEED support is now set internally within TEXT POWER. No need to rely on external utilities like FIXLF.
- (ESC) in almost every situation can be used to abort any TEXT POWER function.
- ERROR HANDLING is improved. For example, PRINTER NOT READY error does not "HANG-UP" your Model-100 but instead beeps to warn you of the situation.



# DISK POWER™



DISK POWER 100/102/200 is a stand-alone Disk Operating System for the Tandy Portable Disk Drive that completely replaces FLOPPY.CO, and comes with an extension to BASIC which can be loaded only when needed. It has operational & size advantages over any other operating system on the market.

## • RAM DIRECTORY:

- 80 character "WINDOW" feature for .DO or .BA files. Also displays TOP, END, EXE addresses for .CO files.
- Number of bytes occupied by an unsaved BASIC program.
- Number of characters in the PASTE buffer.

```
FLOPPYc TSCRAPc LOADERb RAMKILb DATA d
NOTES d TEST b DP100 c BUGGERc SAVRAMb
LETTERd BUDGETb SD100 c -----
DISK POWER 100 (C) 1986 Hugo Ferreira
Montréal, March 29 1986 4 4 Dear custom
er. 4 4 Enclosed you will find the last
BAS= 2381 PST= 547 HIM=49152 FRE=2791
```

- File length of highlighted file.
- 7 lines of actual text packed into the two line window. ◀◀◀
- Total FREE bytes available.
- Value of HIMEN.

## • DISK DIRECTORY:

- In both directories, filename extensions replaced by a single lowercase character. No waste of screen space on redundant information. This allows all 40 disk files to be displayed at once! No scrolling necessary.
- Exclusive multiple file selection feature via single keystroke, to perform any task on upto 20 files at once!
- "ALL" function key automatically selects as many as 20 files, beginning at the current cursor position, to allow Load "ALL", Save "ALL", Kill "ALL", etc.

```
BUDGETd BUGGERc CALC b CHPTR1d CHPTR2d
CHPTR3d CHPTR4d CHPTR5d CHPTR6d CONTRCd
DATA d DP100 c KILBUGc KILLERb LETTERd
MONITRb NOTES d RAMSAVc SAMPLEd SCRMPb
SORT c TABLERb TEST d TP100 c -----
```

## • EXTENSION TO BASIC:

- OPEN disk data (.DO) files for input, output or append. Commands such as EOF, Print, Input are implemented. Full support for Load, Save, LFiles, Merge, etc.
- All the extended functions of DISK POWER BASIC use similar syntax to existing commands, so that your favorite BASIC programs could be converted to take advantage of the Portable Disk Drive in seconds!
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## • EXTENSION TO TELCOM:

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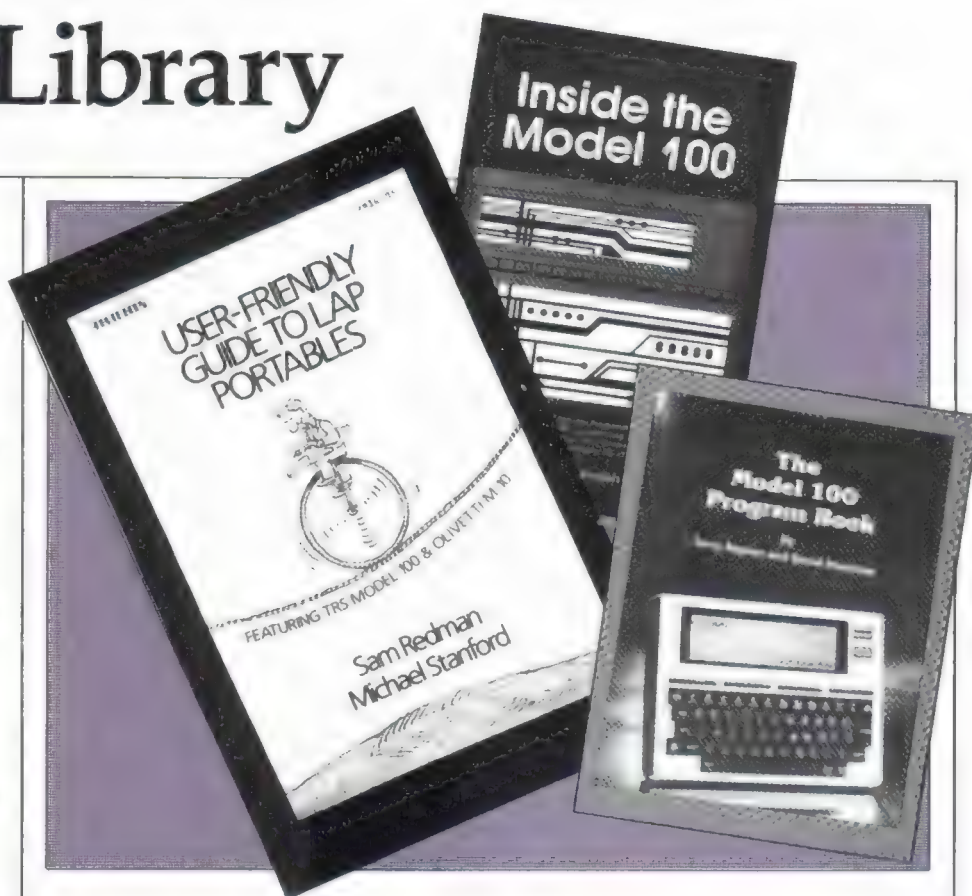
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## Reviving a Downed System

*Preventing crashes is the best way.  
But even when your system is down,  
it's not necessarily out.*

By Dan Drasin

**L**ockup. Cold start. These words strike sheer terror into the hearts of Model 100 and Tandy 200 users all over the world. No one is immune to these senseless plagues that can steal the life out of your precious cargo of information.

But relax. This article will look at what these system crashes really are, how to prevent them and how to recover from them with minimal loss of data. Sometimes, even after an apparently fatal crash, "lost" text files are often only hidden or buried in the computer's memory; with a little work you can get most or all of them back. And the computer, with its built-in software, should spring back as good as new unless it's been physically damaged.

A *lockup* or *freezeup* is when your screen goes blank or becomes immobilized. You pound desperately on your keyboard, but nothing happens. A *cold start* is when your portable suddenly reverts to its "brand-new" state. Your filenames vanish from the main menu and the calendar/clock resets to midnight on the eve of the 20th century. All seems lost.

There are several reasons for system crashes.

- *It's partly congenital.* Unlike most computers, which use magnetic disks for stable storage of valuable files, the Model 100 and Tandy 200 store their files in random access memory (RAM) — the very same RAM used for a dizzying variety of internal operations. Now and then these complexities, combined with a few inherent system bugs, documentation oversights and human error can conspire to unbalance this delicate state of health.

- *Inner conflicts.* The 100/200's built-in software isn't good enough for some of us, so we supplement it with commercial, public-domain software or home-brewed BASIC programs. These might work wonders, but they run slowly and consume too much precious RAM.

Abandoning all restraint, we often load machine-language programs into our subcompact's tank. Machine language uses very little RAM and takes control of the computer at a level that boosts speed and efficiency. But unlike plain vanilla BASIC programs, machine-language programs (and BASIC programs containing POKE instructions) are feisty and territorial. Two of them inadvertently loaded or poked into the same area of RAM can take the whole system down with them as they fight to the death for control of the machine.

- *Glitchcraft.* Plug your AC adaptor into a wiggly, loose wall outlet or cheap or worn extension cord, and be prepared to lose your files. Glitches caused by loose AC receptacles can erase your portable's memory in a twinkling. Inexplicably, some machines seem less susceptible than others. For example, neither of my own Model 100s has crashed, in spite of ample carelessness on my part. A few of my friends haven't been so lucky.

- *Peripheral problems.* On page 189 in my Model 100's manual it says, "Before connecting any optional equipment to the Model 100, be sure that the computer and the optional device are both turned off. Turn the computer's power on, then the optional device.

*Text continued on page 49*







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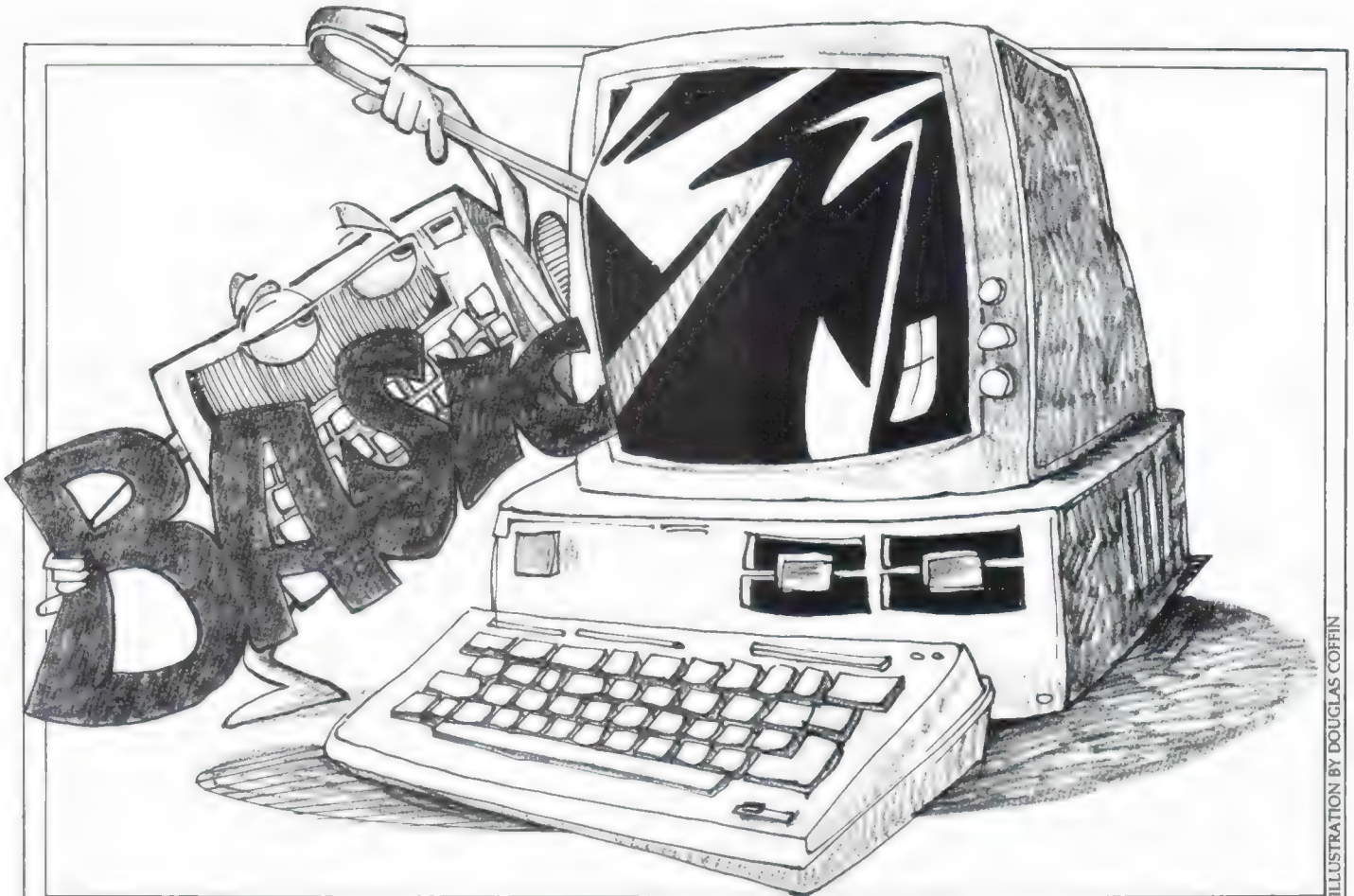
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# Using BASIC'S Bigger Brother

*Making your portable programs work on a desktop.*

By Alan L. Zeichick



Writing a program for two computers is twice as nice as one — especially if the program has commercial value. That's why software developers flock to computers with compatible operating systems and languages. No non-laptop computers are particularly compatible with the Model 100 or Tandy 200, but if you've created interesting applications software for the laptops, you might think about transporting them over to bigger computers. A good destination might be the ubiquitous MS-DOS personal computer (PC), such as the Tandy 1000 or IBM PC.

Since our laptop BASIC (to coin a phrase) and MS-DOS's common GW-BASIC were both written by Microsoft, you'd imagine that the languages would be very similar. And you'd be right. Still, it's a rare program that runs

on both a PC and Model 100 without modification.

It's easier moving software from the laptop to the PC than vice-versa, since laptop BASIC is a simpler language. To start with the most basic problem: Forget about peeks and pokes. PC memory is organized *much* differently than laptop memory. Besides, escape sequences or special GW-BASIC keywords can replace many laptop direct memory accesses.

A fundamental difference between laptop 100 and PC BASIC is their *lexical standard*. Model 100 and Tandy 200 use Microsoft's lexical version 4.51, which means that spaces between keywords are not significant, variable names with embedded reserved words are illegal and variable names are restricted to two significant characters. The GW-BASIC found on most MS-DOS com-

puters uses lexical version 5.0, in which variable names may be made up of any number of characters, spaces *must* separate keywords and the first eight characters of a variable name are significant. So if you're moving a program from a laptop to a PC, be sure to insert spaces between keywords; if you're moving from a PC to a laptop, shorten the variable names to two characters.

A quick example of the former situation:

```
10 FORA=BTOCSTEPD
```

The Model 100, which uses lexical 4.51 standards, would interpret this as a FOR statement. A PC, however, would assign the variable FORA the value previously assigned to the variable BTOCSTEPD. For the PC, the statement should be rewritten:



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```
10 FOR A = B TO C STEP D
```

Another important set of differences between PCs and laptops is due to Microsoft's *execution standards* 4.51 and 5.0. The former executes a FOR-NEXT step at least once, performing the conditional checking at the end. The newer GW-BASIC standard performs the test at the *start* of each loop, which is more intuitive for a programmer — or program debugger.

Consider the following program:

```
10 A = 20
20 FOR I = A TO 10
30 PRINT "Executed the loop"
40 NEXT I
50 END
```

In GW-BASIC, running the program will produce no output, since I's starting value (20) is greater than its ending value (10). But on the Model 100 and Tandy 200, the program will print "Executed the loop" once before ending.

## MAJOR INCONVENIENCE

My first main complaint about execution standard 5.0 is demonstrated by the following program segment:

```
510 DF$ = "INPUT.DO"
520 PRINT "Type new file name, or
Enter for previous:"
530 INPUT DF$
```

This technique is useful for preparing defaults for user prompts — the "press Enter and I'll make an assumption." By varying the assignment to DF\$ in line 510, the default can be neatly changed throughout the program. If the user simply presses Enter at a single-variable INPUT statement, the value of that variable will be left unchanged. Not so at PC-type execution standard 5.0 — string variables are assigned the null string ("") and numeric variables are assigned the value zero. So on the PC you'd have to re-write the program segment:

```
510 PRINT "Type new file name, or
Enter for previous:"
520 OF$ = DF$
530 INPUT DF$
540 IF DF$ = "" THEN DF$ = OF$
```

Perhaps the single most bothersome difference between laptop and PC BASIC is PRINT @ and LOCATE. The laptop computers use PRINT @ 41 to

position the cursor on the second line, first column before printing. GW-BASIC systems use LOCATE 2,1 for the same purpose, with the first number signifying the row, the second denoting the column.

Take the laptop statement PRINT @nn, X\$. If the PC is set for a 40-column screen (WIDTH 40), you can use this PC LOCATE-PRINT sequence instead:

## It's a rare program that runs on both a PC and Model 100.

```
LOCATE (nn-1)/40+1, (nn-1) mod 40+1:PRINT X$
```

Similarly, the substitution for LOCATE x,y is PRINT @ (x-1)\*40+y.

Still, it's a pain in the neck.

## MINOR INCONVENIENCE

Most of the other laptop BASIC features that are missing or changed in GW-BASIC are pretty minor. For example, the laptop CRSLIN (return cursor row position) is called CSRLIN on the PC.

On the Model 100 and Tandy 200, PRINT FRE(0) returns the amount of available random access memory (RAM) and PRINT FRE("0") displays the amount of unused string space. In GW-BASIC on the PC, both variations print the amount of memory not being used by BASIC — there's no way of finding the amount of unused string space. Along the same lines, there's no PC equivalent of the HIMEM and MAXRAM functions.

Although most ON-code sequences are the same from the laptop to the PC, MS-DOS can address multiple serial ports, so the device name COM: must be changed to COM1:. Also, the laptop COM ON, COM OFF and ON COM become COM(1) ON, COM(1) OFF and ON COM(1). Of course, COM2: may also be used. The ON MDM and ON TIME\$ families of statements aren't available under GW-BASIC. While on the subject of devices the laptop CAS: and RAM: devices aren't used by GW-BASIC. The LCD: device is renamed SCRNI; and LPT: is renamed either LPT1:, LPT2: or LPT3:.

Other standard input and output

functions are the same between the two types of computers, with the exception of LCOPY, which copies the contents of the Model 100 or Tandy 200 display to the printer. This function isn't available through a GW-BASIC program, though the MS-DOS Shift-PrtScrn keystroke combination provides the same function manually. The laptop function LPOS, which returns the horizontal position of the physical printer's printhead, isn't implemented in GW-BASIC.

The Model 100/Tandy 200 immediate mode commands (those that affect the BASIC environment) are implemented similarly in GW-BASIC. An exception is the CLOAD, CLOADM and MOTOR family of functions, which haven't MS-DOS equivalents. File loading is handled through the LOAD and SAVE commands only.

Since GW-BASIC isn't RAM-based, the laptop IPL function, which defines a program to run upon power-up, isn't applicable. MS-DOS users can define a similar operation in their AUTOEXEC.BAT file, however. The POWER function doesn't apply to the desktop computer, either.

To exit BASIC on a laptop, you use the MENU command, which returns you to the main file menu. On a desktop computer, that command is SYSTEM, which returns to the MS-DOS prompt.

Finally, the default meaning of the ten or twelve desktop function keys is very different than those used in laptops.

## CAN'T GET THERE FROM HERE

To summarize, you'll have an easier time moving programs from a Model 100 to a Tandy 1000 than the reverse: The laptop's BASIC language is far simpler, and many of the large computer's constructs (such as WHILE or DEFFN) are difficult to implement on the Model 100. Most of the variations between laptop BASIC and its bigger brother are either syntactic — like using MENU instead of SYSTEM — or ones that just wouldn't apply to both systems, like MOTOR ON. So if you're developing software that's going to be used on both, write the original version on the laptop. When it's ready, move it over to the desktop computer and make the very few changes necessary to make it run. Then use the advanced GW-BASIC statements and functions to streamline the application.

Happy programming! □



# BASIC and the Tandy 600

*Contributing editor Carl Oppedahl put the 600's BASIC ROM to the test and found some good and bad points — and some solutions.*

By Carl Oppedahl

The long-awaited BASIC ROM for the Tandy 600 has finally arrived. That's right, unlike its predecessors the Model 100 and Tandy 200, BASIC is not a built-in feature of Tandy's latest laptop. It comes as a separate \$129.95 option ROM that fits in the 600's Multiplan ROM socket.

The BASIC ROM for the Tandy 600 hasn't been available for very long, so not a lot has been written about it. But in fact there are several ways the Tandy 600 BASIC differs from versions on the Model 100 or Tandy 200, and it has its own strengths and weaknesses. Perhaps one of the best kept secrets about BASIC is its ability to streamline time-consuming, repetitive database manipulations.

## SOME DIFFERENCES

Tandy 600 BASIC has no commands that allow access to hardware-level functions. With many computers, if you must send data out the RS-232 port to a printer and BASIC does not support the RS-232 interface explicitly, you can nonetheless get the data out (albeit slowly) by appropriately chosen INP functions and OUT commands. On machines where I/O is memory-mapped, you can often use PEEK functions and POKE commands to accomplish the same thing. The 600's BASIC is not that way.

BASIC on the Tandy 600, like that in the 100 and 200, allows you to edit a single line by just typing EDIT and a line number. Editing more than one line at once is quite cumbersome. With the 100 and 200 you can edit multiple lines by typing, say, EDIT 10-40. Try that on the 600 and you'll get an error.

The Tandy 600 manual suggests that you can edit multiple lines by saving the BASIC program to an ASCII file and editing it using WORD, the 600's built-in text editor. Getting the BASIC file into WORD is easy enough, but then you have to try to get the edited text back into BASIC. The manual gives no clue, let alone an example, about how to do it.

The problem is that you'll get an

Routine	Refers to	What it Does
DBOPEN	database	opens a database
FGID	field	gets a field ID
FGTYPE	field	gets the data type for a field
DBSORT	database	sorts a database
RNUMF	record	determines the number of records in database
ROPEN	record	opens a record
FGET	field	gets a field
RCLOSE	record	closes a record
DBCLOSE	database	closes a database

Table 1: Selected Tandy 600 BASIC database routines.

error message if you try to load a WORD (WRD) file into BASIC. After ten minutes of trial and error, I figured out a way to proceed using the PRINT command in WORD. Instead of directing output to a printer, I sent it to a random access memory (RAM) file, and then loaded it.

There were a couple of drawbacks to this procedure. One was that I ended up with page breaks and margins in my BASIC file. The other was that I somehow collected residue from extra files that had to be deleted. But it worked.

Another minor difference between the laptop BASICs is that the 600 requires spaces between keywords. This is hard to get used to after being spoiled by the 100 and 200 that let you run each BASIC line together without spaces.

## INPUT AND OUTPUT

Tandy 600 BASIC contains no provision for output to a serial printer, nor for input or output to the RS-232 interface or modem. By comparison, the 100 and 200 allow trouble-free, fully buffered, interrupt-driven access from BASIC to the RS-232 and modem connections.

If you want BASIC in your Tandy 600 to be able to use information received on the RS-232 port you must manually go into TELCOM, set up the parameters, select the RS-232 port (through an obscure modem-select menu) and manually initiate and complete a download to a RAM file in the 600.

Then you must exit TELCOM and enter BASIC. BASIC can then open the Tandy 600 RAM file for input. It's a ten-minute operation, and each time you wish to do it you must retype all the menu selections and push the various function keys.

On the 100 or 200 you just execute a simple command like OPEN "COM:57E1E" FOR INPUT AS 1 and BASIC can then receive information from the RS-232 port under complete program control. (The highly-touted WORKS operating system used in the 600 has a system command called COPY that allows file copying from one device to another. But even it doesn't have the ability to copy to or from the serial port.)

There are good things about Tandy 600 BASIC. For example, a detailed and workable library full of subroutines is provided to allow BASIC to gain access to and modify database files. The database file must be in RAM — if you have a database file on disk you'll have to copy it.

The availability of the database library means that from within BASIC you can do lots of nice things that the built-in database program FILES cannot do. For example, you might wish to print a report at 17 characters-per-inch (cpi) to fit 132 columns on 8.5 inch paper. But to switch the printer to 17 cpi you have send an appropriate control code (ASCII value less than 32) or escape sequence (ASCII value of 27 followed by other values). The Tandy 600 built-in software lacks the ability to



send such values to a printer, so you're stuck with whatever print spacing the printer has when it is turned on, typically 10 cpi.

I find that when I am using the 600, I must keep a 100 or 200 around simply for sending control codes to the printer. Fortunately all three computers use the same printer cable so it is easy to plug any of the three into the printer.

## BASIC TO THE RESCUE

If you've read "Shaking Hands with Your Tandy 600" (*Portable 100*, January 1986) you know that when I first got my Tandy 600, I transferred a large database of names and addresses into it. Once a month or so, I feed in the additions and corrections and print out a new directory, copies of which sit by my phone at home, at the office and in my suitcase. The 600 has the advantage of being portable and reliable, but as you'll find out, the printing process is awkward and time-consuming.

The 600's built-in database software has the ability to send simple reports to the printer (or to a RAM file). Unfortun-

*Listing 1: A program to overcome print limitations of the Tandy 600's built-in database software.*

```
10 LIBRARY "dbcalls.lib"
   :S$=""
   :NL=1
20 OPEN"lpt1:"FOR OUTPUT AS 1
   :PRINT #1, CHR$(29)+DATE$
   :NL=1
   :DIM F$(10), F(10), T(10), L(10)
30 READ DA$, NF
   :CALL DBOPEN(DA$, 0, H)
   :FOR I=1 TO NF
     :READ F$(I), L(I)
     :CALL FGID(H, F$(I), F(I))
     :CALL FGTYPE(H, F(I), T(I))
     :NEXT
   :FOR I=1 TO NF
     :IF T(I)<>1 THEN STOP ELSE NEXT
40 READ NS
   :IF NS=2 THEN READ SF1$, SF2$
   :CALL FGID(H, SF1$, SF1)
   :CALL FGID(H, SF2$, SF2)
   :CALL DBSORT(H, 0, SF1, 0, SF2) ELSE READ SF1$
   :CALL FGID(H, SF1$, SF1)
   :CALL DBSORT(H, 0, SF1)
50 CALL RNUMF(H, NR)
```

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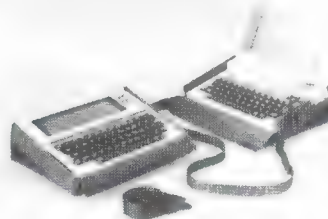
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```

:FOR J=0 TO NR-1
:CALL ROPEN(H, J, 0)
:P$=""
:FOR I=1 TO NF
:A$=S$+""
:CALL FGET(H, F(I), A$)
:P$=P$+LEFT$(A$+S$, L(I))+""
:NEXT
:PRINT #1, LEFT$(P$, 80)+CHR$(19)+"Stupid"+
  CHR$(17)+MID$(P$, 81)
60 NL=NL+1
:IF NL>56 THEN GOSUB 90
70 CALL RCLOSE(H)
:NEXT
:CALL DBCLOSE(H)
:READ FF
:IF FF=12 THEN GOSUB 90
80 GOTO 30
90 PRINT #1, CHR$(12);
:NL=0
:RETURN
100 DATA"rolo-al.dat", 6, "Name", 30, "Firm", 25,
  "Address", 30, "City-State", 20, "Zip", 10,
  "Phone", 12, 2, "Name", "Firm", 0
110 DATA"rolo-mz.dat", 6, "Name", 30, "Firm", 25,
  "Address", 30, "City-State", 20, "Zip", 10,
  "Phone", 12, 2, "Name", "Firm", 12

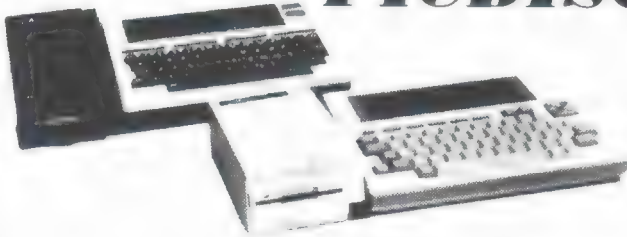
```

nately the software uses a vertical bar (ASCII value 124) to separate fields. On my Okidata 92 printer that bar looks a lot like a "1." Thus a street number of 23 preceded by the field-separation character is all too easy to mistake for 123. I wanted to use BASIC to print the report, since in BASIC I can choose whatever field separator I want, like a simple space.

Additionally, the built-in report generator — while clever enough to skip over the page perforations — always jumps to the top of the next page when the printout has been completed. Due to its large size, half the names were in one file (A through L) and half were in another (M through Z), resulting in an unsightly gap in the middle of my directory printout. The built-in ROM software cannot handle RAM files bigger than 64 kilobytes (K).

Another reason, then, for using BASIC to print out my directory was that from BASIC it would be an easy matter to extract the records from the first data base and then just continue with the second data base in the middle of the page. That way there wouldn't be any empty space between

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## 600 BASIC

the L's and the M's in my printout.

One of the more exasperating problems is that the 600 does not let you store frequently-used sequences of keyboard entries as batch files. On most disk-based operating systems you can build a command file that can be executed by the operating system just as if the commands had been typed at the keyboard. But on the Tandy 600 I had to enter the various commands (some three minutes' worth of keystrokes) all over again each time I wanted to print out a new copy of the database.

So a final motive for setting up a BASIC program to print out my database was that I could simply type the command to run the program and walk away — the program would do everything required to print the file.

### THE BASIC PROGRAM

To gain access to a database that has been created using the ROM-based program **FILES**, the BASIC program uses database calls that are provided on a disk with BASIC. The calls are contained in a so-called library file called **DBCALLS.LIB**. When BASIC is executing and it encounters the word **CALL** followed by a name, it searches the library file for the location of the routine with that name. This allows execution of machine-language subroutines from within BASIC, and permits values to be passed between BASIC and the machine language routine through variable names (or constants) in an argument list.

The various calls for database manipulation are described in the Tandy 600 BASIC manual. Routines are available for creating a file, opening an existing file, inserting or deleting records, sorting records and extracting or modifying fields within records.

The program I wrote does not use any of the calls that would modify the database in any way. I purposely restricted myself to routines that merely sort and extract information to be printed. See Table 1.

I'll mention the calls briefly here; the manual covers them in greater detail. I start by sending a control code to the printer for compressed type. I then open the database file with the **DBOPEN** call and the routine returns a numerical value to the variable here designated **H**. That value is used in the rest of the program when other routines are called. The value **H** is called the "handle" for the database.

My database contained a number of



fields that didn't need to be printed in the directory. So I set up data statements listing only the items I wanted to print. The FGID figures out where within the database the field with a particular ID (a name or city, for example) may be found. Each field ID, also a numerical value, is used in subsequent calls to extract the field contents.

The file is sorted according to one or two fields I designate in data statements using the call DBSORT. It's quite fast since it's in machine language: Each 500-record file takes only 20 seconds to sort by two fields. The number of records is shown in the file using RNUMF.

Next, a FOR loop goes through a repetitive process; opening a record, extracting the desired fields from the record, printing them and going on to the next record. A second loop is superimposed that counts the number of lines printed and jumps over the page perforations. When the first database is done, the program closes that one and opens the next. When all are done, a form feed is sent to the printer.

One stumbling point left unclear in the 600's manual is the relation between the number of records revealed to the user by the RNUMF function and the record number provided to the ROPEN command by the user. The manual does nothing to dispel the impression that records are numbered from 1 to N. But if you try to open record N you get a cryptic error message. Only by trial and error do you learn that record numbers provided by the user to the ROPEN command start with zero and must never exceed N-1, where N is the number yielded by RNUMF.

It's here I learned of a flaw in 600 BASIC's provision for sending information to the printer. As it turns out, the BASIC printing routine keeps track of the supposed position of the print head on the printer. This is done by counting the characters that are sent up until a carriage return (ASCII 13) is sent. (The position is available to the BASIC programmer in the LPOS function.)

Not just any carriage return will reset LPOS to zero, but only one that is sent by virtue of a PRINT command ending with something other than a semicolon. Of course, the LPOS value does not always match the physical print-head position because some characters (e.g. escape sequences) do not result in print-head movement but do cause the LPOS value to be incremented.

*Text continues on page 57*



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# DVORAK: A Better Dkeyboard

*Changing the face of the Model 100 keyboard*

By Mike Nugent

**F**ACT: An average typist's fingers travel 16 miles per day. FACT: Fifteen of those miles are wasted. Why? Because the keyboard — your keyboard — is an antique. A 19th-century relic!

Designed in the 1870's by Christopher Sholes, the traditional keyboard is deliberately arranged to slow you down so you won't jam the mechanical parts of early typewriters. But that just isn't a problem on your modern computer, is it? For you, those extra miles only mean more work and more typos. Why put up with it?

The Dvorak keyboard is efficient. It eliminates wasted motion so you can type faster with less error and fatigue. That 16-mile hike becomes a one-mile stroll, and your fingers won't mind the walking. Just ask the nation's directory assistance operators, who are among the more than 100,000 Americans already using the Dvorak keyboard. And that number is growing, because Dvorak makes sense.

With that in mind, here's DVORAK.BA, to give your Model 100 a Dvorak keyboard. It's easy to use. Just run it once and swap your keys — that's all there is to it. Then you can remove DVORAK.BA from your machine, leaving behind a 281-byte keyboard filter that you can turn on and off at will.

Before we go any further, please remember to back up your important files! DVORAK.BA creates machine language, and mistakes here could boot your computer right back to the turn of the century, when your keyboard was only 30 years old. While you're at it, save DVORAK.BA to cassette or disk.

Run DVORAK.BA. It installs the keyboard filter just below HIMEM and then adjusts HIMEM to protect the filter and anything in memory above it. Next, turn off the computer and swap the keys, using your official "Dvorak Keyboard Reconfiguration Tool." Mine looks remarkably like a paper clip that has been first straightened and then bent into a U-shape, with little quarter-inch hooks added to the free ends.

Lower the tool over a key and work the hooks up under it. (Mine works best when grabbing a key diagonally from opposite corners.) Gently lift the key, rocking it back and forth until it pops off. Remove all the letters and punctuation keys except the A, M and +/- keys. Those three keys won't change, nor will the numbers and special keys (Esc, Tab, Ctrl, etc.).

To place the keys into the Dvorak arrangement, press each key gently but firmly onto its respective switch.

When you've finished, turn on the machine. Go to BASIC, press F6 and — *voila*, you have a Dvorak keyboard. Welcome to the future. It'll take some adjustment, but you'll find it worth the effort.

For starters, you can type more than 3,000 common English words directly on the home row, as opposed to a mere 100 on the old keyboard. That's because Dvorak's home row contains the letters used in 70 percent of your typing. Your stronger right hand now handles 56 percent of the load, whereas the weaker left hand previously did most of the work.

Dvorak favors the first two fingers of each hand, which are typically stronger. And the hands move *up* for punctuation, easier than moving down. Learning to type on the Dvorak keyboard is easier than on the Sholes. You "hunt-and-peck" typers have the advantage here. The rest of us must unlearn some old moves. Typically, a 40 word per minute typist becomes equally proficient on Dvorak in about 40 hours, roughly one hour for each wpm of present speed. After that, you won't want to go back.

Your new Dvorak keyboard conforms to the ANSI x4.22-1983 standard with only two minor exceptions. First, the rectangular brackets are reversed,



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Drive weighs only three lbs. and it works directly from the 110 outlet and recharges at the same time. It recharges in six hours with thousands of pages transferred between charges. It's compact, with dimensions of 2¼" x 5½" x 7.5"; and fits easily into your briefcase along with your Model 100 or 200.

Machine code programs, BASIC programs, *Lucid* files and documents all are saved and retrieved with no protocol—instantly, ready to run.

In a special association, Holmes Engineering and PCSG have worked together combining the hardware knowledge of Holmes and the software expertise of PCSG. The result is a product that can only be regarded as excellent.

**You see the disk directory instantly; works just like the main menu**

Here is what is really exciting. The portable disk drive has Random Access. Included as part of the operating system in the drive (ROM) is a very powerful disk BASIC.

This means that you can have BASIC programs that will access the diskette and read and write records directly on the diskette.

Just imagine yourself with this kind of capability.

*Database*—The portable disk drive stores your mailing list, inventory items, part #s and descriptions or any other data that you need to recall.

## 358K on a diskette

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*Sort*—This excellent utility allows you rapid sorting of any records you have compiled. You can write the newly sorted list back in the same file on the diskette or to a new file.

*Telecom interface*—If you are a user that likes to access other computers or databases (for example CompuServe) by telephone then this powerful facility alone is worth the price of the disk drive. You can automatically download and upload information onto the diskette.

*Calendar*—Everyone who has seen this program has said, "This is the first calendar/

diary/scheduler on any computer anywhere that I can use. It is so functional."

The calendar program is usable for two reasons, first it is designed correctly, and second you have the memory (358K) on the diskette to log and access a tremendous amount of notes over a long period of time.

*Personal Finance Manager*—This wonderful program truly lets you keep track of your finances.

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We at PCSG believe we have the ultimate Model 100 system, the Portable Disk Drive plus the *Lucid* spreadsheet on snap-in ROM, *Write ROM* word processing and the new 64K RAM expansion now available from PCSG.

We want you to find out for yourself at no risk. If you aren't totally satisfied within 30 days, simply return the disk drive for a full refund. Priced at \$399.00, including the software library. MasterCard, Visa, COD.



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## KEYBOARD

your right bracket being the shifted one. Second, ANSI calls for the 'cents' symbol above the number six. Your keyboard has the caret there, which you'll need for many uses peculiar to the Model 100. To generate a 'cent' symbol, press Grph 6, just as you did on your old keyboard.

**An average  
typist's fingers  
travel 16 miles  
per day.**

Since the key caps have been moved, breaking up the Model 100's embedded numeric keypad, this version of Dvorak simply disables the NUM key. It has no effect now. The Dvorak filter stays in high memory. You can toggle the filter on and off with this one-line BASIC program. Save it as TOGGLE.BA.

10 POKE 62975,PEEK(62975) XOR 10:  
MENU

When you want to toggle from the Dvorak configuration to Sholes or vice versa, simply select TOGGLE.BA at the Model 100 main MENU and press Enter. When the MENU returns, the alternate keyboard configuration is active.

Note: The Dvorak filter must remain protected by the HIMEM pointer. ware of programs that CLEAR xxx, MAXRAM or some value above HIMEM. They can overwrite the filter and cause a cold start. One solution is to modify the offending programs to respect HIMEM, for example, CLEAR xxx,HIMEM (or HIMEM-*nnn*).

### GET THE ADDRESS RIGHT

Attention, Tandy Portable Disk Drive users. FLOPPY.CO must load at a specific address, so you must ensure that DVORAK.BA installs the filter below FLOPPY's load address. Here's how. In line 10 of DISKGO.BA, FLOPPY's load address is the *xxxxx* in the CLEAR 256,*xxxxx* statement. Before running DVORAK.BA, type that CLEAR statement to preset the HIMEM pointer, and then run DVORAK.BA. Finally, modify line 10 of DISKGO.BA as follows:

```
10 IF HIMEM < xxxxx THEN CLEAR
256,HIMEM ELSE CLEAR 256,xxxxx
```

Thereafter, should anything exist in protected memory below FLOPPY's load address, DISKGO will simply load FLOPPY without changing the HIMEM pointer. For users of multiple RAM banks, it's essential that Dvorak filters reside at the *same address* in each bank. So before starting, be sure that HIMEM is the same value in all banks. Then run DVORAK.BA in each bank (first making the FLOPPY.CO fix, if that applies to you). But don't swap the keys or press F6 yet. When all banks are done, power down, swap the keys and power up. Now in each bank go to BASIC and press F6, enabling Dvorak in that bank.

DVORAK.BA serves as an introduction to the Dvorak keyboard. It gets you up and running but is vulnerable to interference from other programs. For more serious applications, I'm making available a tape with several versions of DVORAK for various hardware/software combinations, including a functional numeric keypad. For a copy, mail \$24.95 (check or money order) to Tri-Mike Network East, 33

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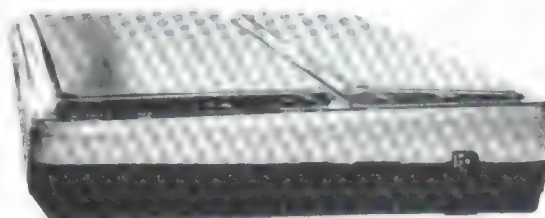
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DVORAK.BA: a program for converting the Model 100 to a Dvorak-style keyboard.

```

10 CLS
   :PRINT "DVORAK.BA Keyboard Filter Program"
20 PRINT "Copyright 1986 by M.J. Nugent, Jr."
30 PRINT @120, "Installing Dvorak filter..."
40 '---- init ----
50 READ SIZE
   :NH = HIMEM - SIZE
60 CLEAR 256, NH
   :DEFINT I, J
70 READ SIZE, HOOK, BLKS, RX
80 DIM RP(RX), RO(RX)
90 '---- load m/l code ----
100 DST = HIMEM
110 FOR I=1 TO BLKS
120 READ TYPE
130 ON TYPE GOSUB 500, 600
140 DST = DST+LN
150 NEXT
199 '---- relocate ----
200 ENTRY = HIMEM
210 FOR I=0 TO RX
   :READ RP(I)
   :NEXT
220 FOR I=0 TO RX
   :READ RO(I)

```

Virginia Drive No. 22, Monroe, MI 48161. A similar package for the Tandy 200 is in the works and should be available as well.

As for you switch hitters, how would you like to have both the Dvorak and Sholes characters on one set of keys? I'm looking into it. To learn more about Dvorak, contact the Dvorak International Federation at 11 Pearl Street, Brandon, VT 05733. Telephone (802) 247-6020. They can supply information on where to get training materials, keyboard conversion software for

**Your  
keyboard is a  
19th century  
relic.**

other computers and just about anything else relating to Dvorak. Federation president Virginia Russell was most gracious and helpful to me in my research for this article. Yes, Virginia, there is a Model 100 Dvorak program! □

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```

: NEXT
230 FOR I=0 TO RX
240 LCN = ENTRY+RP(I)+1
250 FX = ENTRY+RO(I)
260 B = INT(FX / 256)
: A = FX - B * 256
270 POKE LCN, A
: POKE LCN + 1, B
280 NEXT 299 '---- stuff vector ----
300 POKE HOOK, 201
310 B = INT(ENTRY / 256)
: A = ENTRY - B * 256
320 POKE HOOK + 1, A
: POKE HOOK + 2, B
399 '---- beep 'n' boogie ----
400 BEEP
410 PRINT @120, "Dvorak filter installed at"; HIMEM
420 PRINT
430 KEY 6, "POKE62975, 195" + CHR$(13)
440 END
499 '---- subroutines ----
500 READ LN
510 FOR J=0 TO LN - 1
520 READ BYTE
530 POKE DST + J, BYTE
540 NEXT
550 RETURN
599 '
600 READ LN, SRC
610 FOR J=0 TO LN - 1
620 POKE DST + J, PEEK(SRC + J)
630 NEXT
640 RETURN
699 '---- data (obviously!) ----
700 DATA 281, 62975, 9, 14
710 DATA 1, 2, 227, 225
720 DATA 2, 121, 6965
730 DATA 1, 9, 205, 92, 118, 33
735 DATA 132, 0, 195, 151, 115
740 DATA 2, 21, 28757
750 DATA 1, 2, 230, 239
760 DATA 2, 37, 28778
770 DATA 1, 3, 196, 208, 0
780 DATA 2, 10, 28818
790 DATA 1, 76, 195, 156, 112, 205
800 DATA 197, 112, 58, 165, 255, 183
810 DATA 200, 58, 166, 255, 254, 43
820 DATA 208, 229, 213, 33, 238, 0
830 DATA 22, 0, 95, 25, 126, 50
840 DATA 166, 255, 209, 225, 201
850 DATA 27, 16, 14, 15, 1, 4, 6, 5
860 DATA 8, 24, 18, 22, 23, 10, 13, 20
870 DATA 28, 29, 30, 25, 21, 11, 12, 2
880 DATA 19, 7, 31, 9, 42, 17, 3, 0
890 DATA 32, 33, 34, 35, 36, 37, 38, 39
900 DATA 40, 41, 26
910 DATA 14, 21, 40, 44, 65, 71, 75, 97
920 DATA 107, 116, 126, 187, 192, 202, 224
930 DATA 123, 50, 50, 50, 85, 63, 89, 120
940 DATA 120, 120, 132, 195, 208, 177, 238

```

## DON'T COMPROMISE!

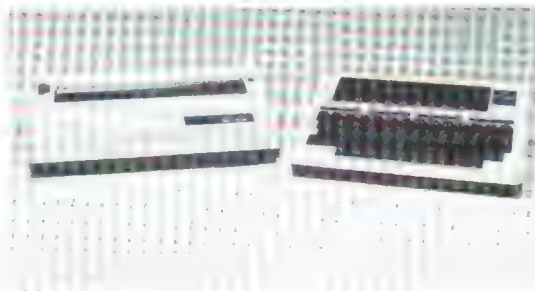
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Always turn the optional device off first, then the computer." Read it and heed it, or risk a freezeup.

● *Phantom printers.* What happens when you press PRINT or SHIFT-PRINT? Normally your portable stops dead for a moment, waiting for a ready signal from the printer. When that signal comes, the computer springs back to life and prints.

But what happens when you inadvertently press PRINT or SHIFT-PRINT with no printer connected, or with the printer powered down or offline? It tries to proceed as before, but with no "ready" signal from the printer, it is frozen in limbo. The same thing can happen in TELCOM's terminal mode, if you happen to press the mysteriously unlabeled F5 (echo to printer) without a properly engaged printer.

● *Powerlessness.* Switch on your portable, and nothing happens. You forgot to plug in the AC adaptor to a live outlet. It happens to the best of us. What if AC power works but the batteries don't? The most likely culprits are loose battery contact springs or a worn, bent or dirty contact in the external power input jack.

The Tandy manuals say that your low battery light means you have about 20 minutes of computing left before the system shuts itself down. But what happens if you continue to use the batteries as far as they'll go, then wait five minutes for the batteries to rest up, and then power-up for another few minutes of borrowed time? Running on the edge of operating voltage has thrown the CPU out of sync, and the result is chaos.

● *Acts of God.* On rare occasions, portables crash without warning or apparent cause. No one knows why; static electricity or the weather might be the culprits.

### VACCINATION: GUARDING AGAINST THE WORST

The first thing you can do prevent disaster is read the instructions. The computer and its peripherals, memory add-ons and software all come with documentation. They often give explicit warnings about machine-language conflicts, device interconnection procedures and so on. Because the Tandy portable community tends to be tightly knit and unusually cooperative,

hardware and software manufacturers often respond quickly with modifications or documented warnings when users report problems.

If instructions seem ambiguous or inaccurate, or if you're unfortunate enough to stumble on an undocumented problem, don't hesitate to contact the manufacturer at once. Chances are they'll be grateful, and you'll probably feel better for having spared others a similar fate.

Another thing you can do is store files outside the machine, and back up your memory regularly. Your 100/200 has no built-in disk drive or other mass storage device, so why not get one? There are a number of excellent products on the market that allow you to back up entire contents of RAM — with one simple procedure — either to disk or tape.

If you use AC power, make sure your wall receptacles are tight and make good contact. If you must use an extension cord, avoid old or worn ones. Check your battery contact springs now and then; if they seem a little weak, stretch them carefully with a pair of needlenose pliers or tweezers.

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keep a spare set of AA alkaline cells with you, and change batteries before a forced shutdown. (To avoid confusion, discard the old ones before unwrapping the new ones.)

## RAISING THE DEAD

If your batteries and battery contact springs are in good shape and your laptop still won't run, suspect the external power input jack. Inserting the AC adaptor plug normally pushes aside a flat, metal tab that breaks the battery connection while the adaptor is supplying power to the machine. Sometimes a speck of dust can wander into the contact gap, blocking good electrical contact when the plug is once again withdrawn.

The solution is to use a sharp instrument, such as a compass point, to gently push aside the flat metal tab several times while blowing into the jack to dislodge any dust. If that doesn't do the trick, gently bend the tab in the opposite direction, toward the center pin. If the computer works only while you're forcing the tab toward the pin, the jack will probably need replacement.

The first thing to do in case of lockup is to press SHIFT and BREAK at the same time. In fact, SHIFT-BREAK will cure 90 percent of all freezeups. If it doesn't do the trick instantly, press them down for five to 10 seconds.

If you're frozen up in TELCOM because you've pressed F5 with no printer engaged, just press F5 again and you'll be back in business instantly. If SHIFT-BREAK doesn't help, switch the power off and wait for 15 minutes. Then power-up again. Spontaneous cure? It's been known to happen.

The next resort is to press the little reset button, located in the recessed niche on the back of the machine. Hold it down for 10 to 15 seconds if necessary. A reset is something like applying electroshock treatment to a befuddled brain, and it is not without potential hazards. While it may get the system unstuck, it may also get your file structure unstuck, with parts of files turning up in other files. But any port in a storm, right?

## STRONGER MEDICINE

By now you're probably wondering why we've mentioned recovery from lockups and freezeups but not cold starts. It's because an intentional cold start — and recovery — is the next and

last resort. In other words, failing the above, you'll have to kill the patient in order to save it. But don't panic: You can recover your text files even after

## Lost text files are often only hidden or buried in the computer's memory.

rigor mortis has set in.

To cold start your portable hold down CONTROL and BREAK while switching the power off and on again. In a moment, a brand new main menu will appear but your filenames will be gone, which means there's no way to get a handle on those files still sequestered in RAM. What to do?

The answer is a simple BASIC program that scoops up the entire contents of RAM and dumps it into a single text file named RESCUE.DO. If you've never written a program before, just follow along carefully; it's easy.

First, go directly into BASIC (don't go into TEXT. Doing so would instantly erase all the files you want to recover). At the "OK" prompt, type the following lines very carefully. Check and recheck each line, and backspace out any errors before pressing Enter. Blank spaces aren't critical, but pay close attention to punctuation (parentheses, colons, semicolons, etc.). Make sure you've pressed Enter after the last line.

```
10 OPEN "RESCUE.DO" FOR
  OUTPUT AS 1
20 FOR X = 33000 TO 62000
30 PRINT #1,
  CHR$(PEEK(X));NEXT:END
```

**Note:** The above program was written for the Model 100 only. According to Peter Van Heusden at PG Design Electronics, you can use it on the Tandy 200 by changing line 20 to read as follows:

```
20 FOR X = 41192 TO MAXRAM
```

Next, recheck all three lines. If you find any errors in a particular line, simply retype the entire numbered line. BASIC will ignore any previous iterations of that line, and will rearrange the lines so they run in the proper order. (Under no circumstances should you use the BASIC statements

NEW, SAVE or EDIT, as these will either reduce or eliminate your chances of recovering your files.)

Now type the word RUN, press ENTER and wait. In five minutes, more or less, you will see either a new "OK" prompt or "OM error." In either case, type the word MENU and press ENTER. You'll see a new file, RESCUE.DO, on the menu. Place the menu cursor over RESCUE.DO and press ENTER.

RESCUE.DO contains the entire contents of RAM at the time of your cold start, including any tokenized BASIC (.BA) and machine language (.CO) files. But unless you're a master programmer, these non-text files will appear to you as random "garbage" characters, and all you can do is delete them to free up memory space. So use the SELECT and CUT keys to erase several screenfuls at a time until you come to something readable, i.e. your old text files, which you can then cut and paste into separate, new files.

## SEEING DOUBLE

RESCUE.DO may contain more than one version of some recovered files. For now, save each of these, since some may be more complete or recent than others. You may have to join several parts together to make one perfectly recovered file.

When you've completed the process, kill RESCUE.DO and reset your clock and calander. It could have been worse; you could have found nothing but garbage in RESCUE.DO. Or you could have found nothing but the complete character set repeated endlessly. It's been known to happen as a result of AC adaptors plugged into loose outlets.

Loose AC-outlet glitches and other evils can sometimes confuse your machine's system so thoroughly that not even an intentional cold start can bring it around. In that event, an "arctic start" is the only recourse. That means switching off the main memory switch underneath the computer for at least five minutes. When you switch it on again and power-up, your system will be like new. Don't bother trying to recover any files this time — they're long gone.

But life goes on. So why not slip a copy of this article into your portable computer's manual to remind you of preventive care, or tape a copy of the RESCUE program to the bottom of your machine, just in case you find yourself needing to revive it. □

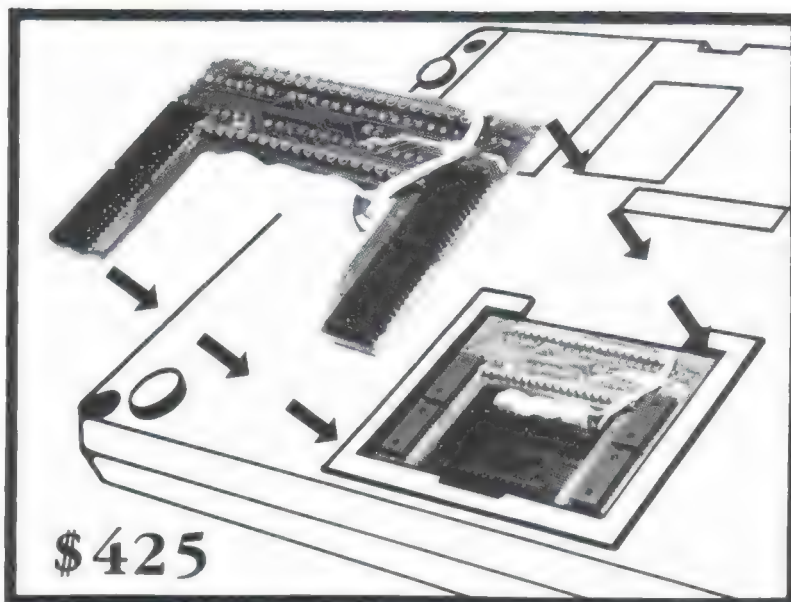


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You then have 4 banks of RAM of 32K each. The additional three banks also work just like your Main Menu.

You push a function key and you are in the second bank. Push again and you are in third, again, then fourth. Press it once again for your original bank.

It has its own built-in NiCad battery that recharges right from the Model 100 and its guaranteed for a full year.

What is really great is that you can copy a file from one bank to another with just a function key.

Each bank is like having another Model 100, and all the built-in programs as well as any snap-in ROM programs appear in all four banks and work the same way. Your widebar cursor moves from file to file and you access any file or run any program just by pressing ENTER.

What lets you copy any file from one bank to another is a snap-in ROM from PCSG called RAM+, that comes at no extra charge. It just pushes right into the little socket in that same compartment with the 96K expansion unit.

Not only does this firmware let you copy a file from bank to bank, but you can make a copy of any file within the same bank instantly with a function key. Great for Lucid spreadsheets!

### Copy a file from bank to bank with a function key

You can also rename a file, or kill any file with just a function key. Plus you can do a whole lot of other useful things like setting the date, day and time with function key ease. You even have a function key that lets you use non-Radio Shack printers without having to make those tricky dipswitch settings.

RAM+ lets you cold start any one of your banks without affecting the other three. That means that anytime you want you can clean out a bank's entire memory, but leave intact all the files in the other banks.

What is also fantastic is that you don't have to have the ROM in place to use the additional RAM. Whenever you take out the snap-in ROM it leaves behind a tiny machine code program that lets you switch from bank to bank just by pressing ENTER.

This lets you use your ROM socket to snap-in other ROMs like LUCID spreadsheet, WRITE ROM text processor, or DISK+ ROM file transfer program, and use them in any or all four banks. All of these, by the way, are available from PCSG.

When you are ready to copy a file from one bank to another or use any of the other fantastic functions we talked about you can just snap the RAM+ ROM back into place.

Everybody that has this 128K system in their Model 100 is so excited, because it gives them four times the capacity and all banks work just like the Main Menu.

And what has made a lot of people happy is that the system bus, located in the same compartment, is left free for you to plug in a DVI or the Holmes Engineering/PCSG portable disk drive.

The ability to copy a file from bank to bank instantly with a function key, plus all of the other features make this RAM extension truly an engineering masterpiece.

Some people hesitate when they think of installing something, and then others are skeptical that any additional hardware could be as good as the Model 100 itself. That's why we sell these 96K expansions on a 30 day trial. Simply return it within 30 days for a full refund if you are not satisfied. Priced at \$425. MC VISA COD.

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while the hourly rate seems high, there are no benefits and medical insurance — and state disability and Social Security taxes must be paid out of the revenues. Explain that contracting independently involves other business expenses, such as time spent approaching clients and preparing project proposals. Your rates must reflect these hidden costs. "It's also a bad practice to associate only with the managers and to ignore the staff (programmers)," he says.

## CONTINUING EDUCATION

Long-time, successful contract programmers stress the need for continuing your technical training while programming and consulting on a contract basis. "Too many new contract programmers fail to keep up on their education," says Gopal Kapur. "They don't attend industry meetings where they might meet contacts for future contracts, they fail to subscribe to industry publications and they refuse to pay for training. They don't realize that they have to read more and be sharper than a regular employee."

"You should keep up with the indus-

try," he continues. "If you can't afford special seminars, at least attend continuing education courses at public community colleges, which aren't too expensive." Cox Ferrall notes that associating with your peers can help you avoid costly mistakes: "Perhaps the biggest danger in working for yourself is the incredible number of wheels that any one person can reinvent," he says. "Until I joined a couple of sophisticated user's groups, I was constantly writing algorithms and discovering bugs that other people already knew about and had solved."

Target your association memberships to the market you're addressing in your sales program. Many of these associations also conduct professional training and certification programs. The Data Processing Management Association (DPMA), for example, has a certificate program that certifies a programmer's level of competency based on annual examinations. Association newsletters provide valuable information for your work, and member directories are an excellent source of sales leads, as are conferences and other activities the organizations sponsor. Their political lobbying activities bene-

fit their industries as a whole, and — as with IPIP (the International Personhood of Illiterate Programmers) — you can even have fun with your peers.

Successful contract programmers all agree that contacts made at professional society activities are the best source of sales leads. "There's nothing better than giving speeches and writing articles in your area of expertise," says Gopal Kapur. "Later, your phone calls and sales presentations aren't cold calls. They give you exposure to your market and access to your potential client." Cox Ferrall simply notes that "you have to network the hell out of (trade associations)."

Kapur points out a frequent error programmers make once they get their first job: "They devote all their time for six to eight months to the project; the project ends or it gets cancelled, and they don't have any new business. It's important to market continuously, even when you're working on a job, and to keep your contacts fresh."

A professional image is the most fragile but most important aspect of marketing yourself as a contract programmer. "It's impossible to spend too much on your business cards and sta-

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## OR HIRE

tionary," says Cox Ferrall. "You're too small to not look like a quality organization." While echoing Ferrall's comments ("the business card shouldn't be flashy or overbearing, but professional"), Kapur adds that many technical people can't really write clear letters, which are important in the initial sales process and ongoing client contact. "If you write poorly, find a part-time executive secretary who can edit your letters, drafts and memos for grammar and punctuation," he advises. "When the times get rough, it's the polish that makes the difference."

One other word of advice: Don't use a company name that's so creative no one can pronounce it. (Like Grzanka Associates, my own firm!)

Contract programmers charge from \$20 to \$100 per hour, depending on the prevailing rates in the geographical area, the level of complexity of the job, and technical knowledge necessary to do the work. "If you're a one-dimensional guy — a programmer who lacks applications expertise — you can charge from \$20 to \$40 an hour depending on local market conditions," says Cox Ferrall. "If you're an experienced

programmer-analyst — someone with more education, experience and knowledge of the specific application — you can charge from \$50 to \$100 per hour." The trick here is that the final cost to the client is normally about the same whether using a tyro or pro because of the faster speed at which the more experienced programmer works.

Gopal Kapur recommends you find out what the typical contracting house charges for your level of expertise in your area, and then charge 20 percent less. "If you price yourself too low, you'll seem too inexperienced to do the job," he notes. "But if you price yourself too high, you'll price yourself out of a job."

If you're working out of your home, don't make excuses or pretend you have a regular office apart from your living quarters. "The client will find out, and you'll lose a part of your professional image," Kapur warns. "There's nothing wrong with having a home office — when I first started out and worked out of my home, I used to tell the clients it was a great thing — the commute is only 22 steps!"

Kapur recommends you install a

separate phone line for business calls to your home. "And don't let the kids answer the business line," he says. "They may sound cute to you, but they're annoying to the client." Don't make long personal calls, which would frustrate a client trying to reach you during business hours.

"With answering machines in widespread use now, an answering service isn't really necessary," Kapur adds. "But keep your outgoing message short and businesslike, nothing so creative it sounds way out to a client."

## CONTRACTS

Always work under a contract. "If the client is leery of signing a contract, you'll probably have trouble collecting payment too," Cox Ferrall observes. Gopal Kapur says that large companies always have you sign their own contract. If it's for more than \$500, have an attorney review it. If it requires outlays for insurance or equipment before you begin work, try to have the client pay the expense or get a written waiver.

When drafting your contract, it's important to stipulate levels of performance and definitions of performance

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## FOR HIRE

warranties. "When I was first starting out," Ferrall says, "I found myself obligated for data-entry work on a 3000-record master file because I had failed to pin the client down on his definition of 'setting up a database.'" Kapur notes that while it's fine to exclude the normal variances of life from your contract, it's important to stipulate the hours and performance level expected to fulfill the contract at fixed times through the term of the agreement.

It's important to stipulate who retains rights to the software when the job is finished. Most large companies require a "work for hire" contract, which means they own all rights to the product when completed. You have to clearly stipulate that you have marketing rights to the product if you want to resell it later. But — at least under California law — if you've been contracted on a "work for hire" agreement, the client must pay state disability and unemployment compensation taxes for you during the term of the contract, and this gives you leverage to negotiate other rights to the product.

You're skating on thin ice if you don't have a rights agreement at the outset. Dr. Abramson, for example,

avoided contracting on projects related to the product he was developing as the cornerstone for Intellisys. Most companies and contract programmers consider it a breach of ethics

---

**Don't quit  
your full-time  
job until  
you've laid the  
groundwork.**

---

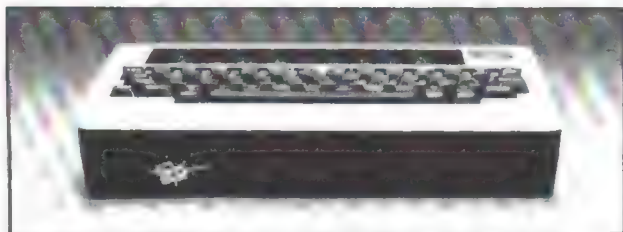
— which will damage your professional reputation seriously — to remarket a program you've produced under contract for another firm without its knowledge. "It's always nice when moral issues can be resolved on economic grounds," notes Cox Ferrall. "When a programmer puts together a program for a firm, he is solving the problem of only one company. If he then brings the product to market, it's based on a sample size of one — and this is rarely successful. If the pro-

grammer wants to produce a truly valuable, marketable program, he should arrange to test it at several companies in the industry." In the industry, this is called Beta Testing a product.

It is, however, possible to obtain rights waivers. For example, Kapur & Associates is now marketing a \$25,000 software development methodology called the Kapur Method 2000, which was developed under a variety of contracts for different clients. Kapur, however, fully informed his clients that he planned to introduce the product to the market and received rights waivers in exchange for initial price discounts for the Beta Test sites.

Proper documentation of your work is always a sticky issue that should be included in the contract. "The users always want extensive documentation until they're told how much it costs to produce it," notes Cox Ferrall. But proper documentation is critical for the people who use and maintain the system: "A company may not think it needs it, and underestimates the importance of proper documentation," Dr. Abramson observes. "But a company should be willing to pay an extra 10 to 20 percent to get the true value of the

# 512K



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## SOME MAJOR INDUSTRY ORGANIZATIONS

While you may obtain information on membership applications and local activities of these organizations from the headquarters offices listed below, first check your telephone book for local chapters.

ADAPSO (Association of Data Processing Service Organizations), 1300 N. 17th St., Arlington, VA 22209, (703) 522-5055. ADAPSO-sponsored conferences:

- Regional Software Expositions
- COMDEX (Computer Dealer's Exposition)
- Management Conferences

AEA (American Electronics Association), 2670 Hanover St., P.O. Box 10045, Palo Alto, CA 94303, (415) 857-9300.

AFIPS (American Federation of Information Processing Societies), 1815 N. Lynn St., No. 800, Arlington, VA 22209, (703) 558-3660. Constituent

### Societies:

- American Society for Information Science
- American Statistical Association
- Association for Computational Linguistics
- Association for Computing Machinery (ACM)
- Association for Educational Data Systems
- Data Processing Management Association (DPMA)
- Institute of Electrical & Electronics Engineers (IEEE)
- Instrument Society of America
- Society for Computer Simulation
- Society for Industrial & Applied Mathematics

- Society for Information Display

AFIPS-sponsored Annual Conferences:

- National Computer Conference (NCC)

- Office Automation Conference (OAC)
- NCC Personal Computing Festivals
- SCS Computer Simulation Conference

IPIP (International Personhood of Iliterate Programmers), P.O. Box 386, Danville, CA 94526, (415) 837-0397.

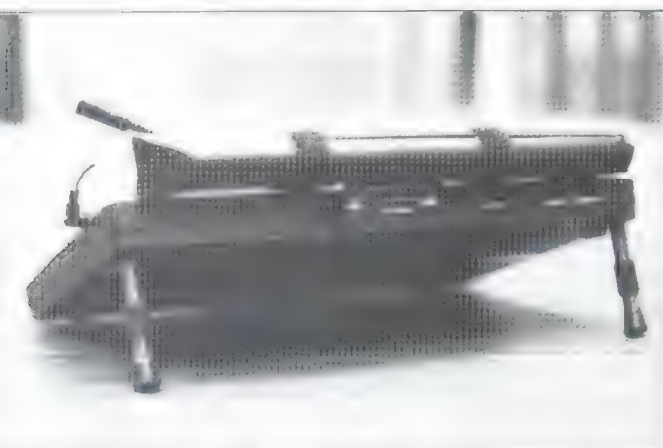
- Membership Certificate Unsuitable for Framing
- Journal of Iliterate Programmers (JIP)
- Annual First Annual Conference of Iliterate Programmers at Disneyland with Goofy as Keynote Speaker

Contract programmers specializing in certain applications should also join the industry associations for that application, such as the American Payroll Association and Internal Auditor's Association if you specialize in accounting programs.

—L.G.

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product through proper documentation."

Your contract should clearly stipulate and define the documentation that you will deliver with the software: operating instructions, data-entry instructions, user manuals or whatever.

Your contract should also stipulate what forms of support you will offer the client after the software is deli-

---

**M**any large companies require you to work on the premises.

---

vered. Cox Ferrall delivered a program to a religious order that computed the special state and federal withholding taxes and reports the order negotiated with the government. "No off-the-shelf program could adequately manage the revenues and governmental reporting, so I designed a series of dBASE II programs that solved their problems," he says. "But now I have to modify the programs or write new routines every time they realize they've overlooked something — or when government regulations change."

While this happens frequently, support also becomes a moral and ethical issue: "Ethically, a programmer should never use sloppy or convoluted code as a source of ongoing business," Ferrall stresses. "Every reputable programmer is responsible for delivering clean, structured programs. But the question arises: How strong is this obligation if the client refuses to pay for it?"

Gopal Kapur also stresses that high-quality software is a hallmark of professionalism — and critical to your marketing efforts. But, he adds, you should stipulate terms, conditions and charges for post-delivery support in your contract. "You can charge a little more, because the interruptions are frequent, but the work isn't as steady as building the original system."

So if you're a hot-shot programmer, go out and learn an application, find some clients, get them to sign your contract, and go to work. Remember: One of the benefits of being self-employed is that you're working for one idiot, not a hundred of them. □



The mere fact that BASIC keeps track of LPOS is not a problem — after all, the 100 and 200 do so and it can be very handy when you want to format your output neatly. The flaw is that 600 BASIC always forces a carriage return when LPOS gets greater than 80. Simply put, when you're hooked up to a 132-column printer you can never print beyond the 80th column with 600 BASIC. To date no one at Radio Shack has been able to tell me how this feature may be defeated.

I was in a real bind because my database requires 130 columns. How could I get around the nasty forced carriage return of the Tandy 600 BASIC? I tried the obvious things like opening the printer as an output device and using PRINT#1. Didn't help — BASIC sensed that the device opened was the printer and started up its LPOS process anyway. I opened the printer as a device with a record length of 132, again to no avail.

A few moments perusing the printer manual (I was using an Okidata 92) revealed a solution. The Okidata has many control codes that almost no one ever uses. One of the most obscure codes is one that "deselects" the printer. Sending a CHR\$(19) to the printer makes it ignore everything sent thereafter. It's as though Sleeping Beauty has been put into a trance and doesn't notice that she is being spoken to.

The printer is awakened by receiving a CHR\$(17), which "selects" the printer again. The solution to the problem, therefore, is to anticipate when the Tandy 600 will send its unwanted carriage return and then put the printer to sleep with a CHR\$(19). Then print a few characters via the BASIC print command (the word "stupid" works fine), which triggers the unwanted carriage return and resets the LPOS to a value much less than 80. The word "stupid" and the carriage return are both ignored by the printer and its print head remains at the 80th column.

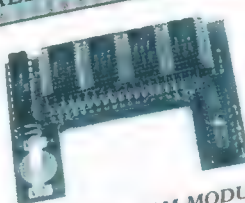
Then send the CHR\$(17) and the remainder of the print line that is to appear to the right of the 80th column.

The completed program, shown in Listing 1, satisfies all my design goals. It sets up the printer for 132-column output, separates columns by spaces rather than annoying vertical bars, and integrates the two database files into one continuous printout. And it does all this with just a couple of keystrokes.

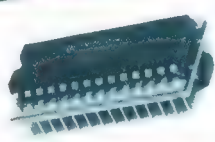
BASIC on the 600 is not a masterpiece, but it's a useful tool in overcoming some of the limitations of the 600's built-in software.□

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## PG Design



something other than the modem there seems to be no problem.

Also, SEARCH cannot seem to find a string starting with even numbered repeating characters. Take, for example, the samples 1abc, 2aabc, 3aaabc, 4aaaaabc, 5aaaaaabc, 6aaaaaaabc. SEARCH will find 'abc' in 1, 3 and 5 but not in 2, 4 or 6. This problem doesn't occur using BASIC INSTR.

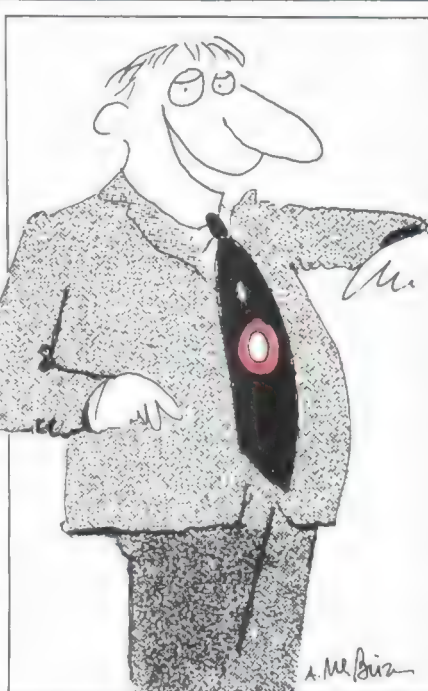
Harry Ewing  
Soulsbyville, CA

## SYNTAX DISCREPANCIES

First, let me say that as a new Model 100 owner, I'm glad to have discovered your magazine. I hope it proves to be as useful as the computer itself.

Second, I was particularly interested in the article "Checking the Menu" on page 68 of your March, 1986 issue. Since I need to add line feeds to the stuff I send from the Model 100 to my Kaypro, I thought it would be just the ticket. However, the program as listed has some problems.

I'm no computer guru, but I noticed some discrepancies between the program and what I thought was proper



BASIC syntax:

1. In line 240, an IF-THEN-ELSE statement is used, but there's no value to compare with PEEK (63066).
2. Similarly, in line 370, there's the

THEN and ELSE, but no IF.

When I ran the program, hitting ESC didn't change the line feed status, but gave me an error message instead. How come?

Third, I'm not very happy with the TEXT program, and had heard of a WordStar work-alike available on ROM chip for the Model 100. All of my efforts to track down the product, however, have been in vain. Can you or any readers give me a clue? I'm particularly interested in whether the program can store text in WordStar format, including soft carriage returns, and has provisions for dumping these files intact into the Kaypro for further editing, formatting and printing.

John LaTorre  
Salinas, CA

BASIC IF statements evaluate Boolean expressions — true or false, or non-zero and zero. The statement IF A = 3 THEN PRINT "Hi" evaluates the logical expression A = 3; if the statement is true, then it returns a -1, if false it returns a 0.

The IF part of the statement checks the result of the Boolean evaluation. If it sees a non-zero result, it executes the THEN statement, and if it sees a zero, it executes the

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ELSE statement (if there is one).

The Boolean expression can be anything which yields a non-zero/zero result. So, IF -1 THEN PRINT "Hi" is perfectly legal, as is IF X THEN PRINT "Hi." Similarly, IF PEEK(-memory location) is fine too, as long as we want the THEN statement to be executed if and only if the memory address is non-zero.

Line 370 contains a typo: just insert the IF before the PEEK at the start of the line. Oops!

By the way, we know of one WordStar-like program for the Model 100: Text Power 100 from Ultra Soft. This program is cassette-based; if you're looking for a ROM, your word-processing choices include PCSG's Super ROM, Traveling Software's Ultimate ROM II, Radio Shack's Interactive Solutions and Polar Engineering's Cleuseau.

—Ed.

### CP/M TRANSFERS

I found your article "Talking Computers" (February, 1986) very useful and thought I might be of some further help with regards to CP/M - Model 100 file transfers.

I have found that I don't need a communications program to transfer ASCII files. PIP will suffice. Before you

complete the 100 upload operation in TELCOM type the following at the A: prompt on the CP/M machine:

PIP FILENAME=RDR:

hit Enter on the CP/M machine then on the 100. When the 100 indicates that the transfer is complete, type a CTRL Z at the 100's keyboard. This returns the prompt to the CP/M machine.

I have a Model 100 with PG Designs 64K. I use their transfer program in all three banks. I have TMPC in the first bank and Lapstar in the third. Unfortunately a hang-up with one program often leads to a blanking of one or more banks and a hauling out of records, cassettes, cables, instruction manuals and phone numbers of the appropriate manufacturers. I love the 100 but I sure could do without the tenuous "cassette connection."

G.T. Buckley  
Eureka, CA

*It's true, 3.5-inch disks and high-capacity RAM expansions have replaced many owners' cassette recorders. Think of the cassette as a reliable, low-cost method of data*

*storage: should your disk drive break, you're out of luck, but if your cassette player goes on the fritz, you can always use your home stereo.*

*Other computers, including the original IBM Personal Computer, started out with cassettes and migrated to disk storage. The Model 100 has good company!*

—Ed.

### NOT SO SIMPLE

Tandy's new portable disk drive is indeed a great little machine for the money. However, I've heard several complaints, like my own, that it's a shame you can only store 100 kilobytes (K) worth of data per 3.5 inch disk. Other machines are capable of storing 360K.

The other day I was in a Tandy Computer Center discussing the disk drive with a sales person. He informed me that according to Tandy, the machine is capable of storing 360K. All that needs to be done is to rewrite the software that drives the machine. If this is true, why hasn't some enterprising individual done this? Unfortunately, my talents are lacking in this area or I

## MEASUREMENT & CONTROL

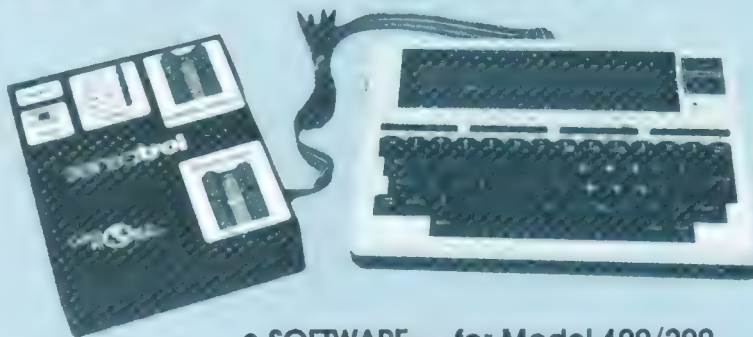
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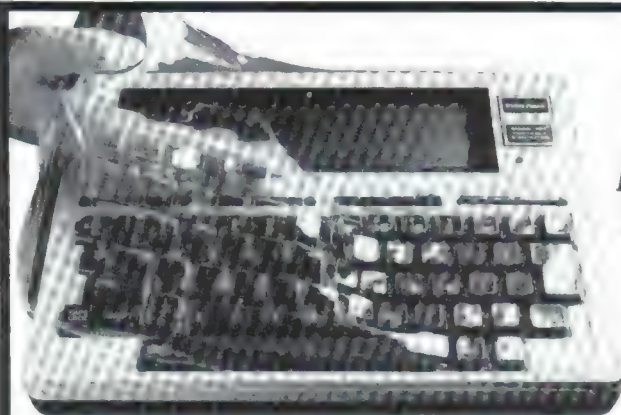
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## GIGO

would give it a try.

David C. Harmer  
Gaithersburg, MD

*The answer is in your question, "If this is true..." It's not true. Your salesperson is misinformed. When developing its portable disk drive, one of the criteria Tandy set was that the drive had to retail for under \$200. In order to do so some sacrifices were made in both hardware and software. The result is as you say, "...a great little machine for the money."*  
—Ed.

### TO THE RESCUE

Regarding your article entitled "A Simple Self-Charger for the 100" (March, 1986). Now let me get this straight: For the cost of one resistor and two sets of two rechargeable batteries, I can make my Model 100 rechargeable. My Model 100 came with a power line adaptor. I assume that the one mentioned in the article is the same as that which came with my machine, even though the authors list it as a separate expense.

I'm not an electrician, but in the second to last paragraph the authors comment that one should not leave the power line adaptor plugged into the machine without plugging the adaptor into the power source. They say this would discharge the rechargables. Correct me if I'm wrong, but doesn't one have to complete a circuit before current will flow? Wouldn't the lack of connection between the prongs on the adaptor result in no connection and hence no current drain? I'm curious.

I read in the owner's manual that a simple operation could be performed by your local Radio Shack dealer to convert to the use of rechargables, and knew therefore that it must be pretty darn simple. I knew someone would rescue us consumers.

Russell M. Hostetler, M.D.  
Macon, Georgia

*The power-line adapter that you use to plug in your Model 100 uses two central components: a diode square to transform alternating current to direct current, and a step-down transformer to change the voltage.*

*A transformer is made of two coils of wire, wrapped about a central iron core. One wire coil is attached to the AC prongs, the other to the plug which goes into the Model 100.*

*When the adapter is plugged into your wall outlet — whether or not the Model 100 is turned on or even connected — current is flowing through the high-voltage side of the transformer. If the Model 100 is connected, the stepped-down voltage flows from the*



other the coil through the nickel-cadmium batteries, restoring their charge.

In exactly the same way, if the adapter is connected to the Model 100 — regardless of whether its plugged into the wall — the rechargeable batteries are shorting out through the transformer. (As a matter of fact, they're generating high-voltage, low-current electricity at the AC end of the adapter.)

To be safest, disconnect both ends of the adapter if it's not in use. Unplugging it from the Model 100 will prevent your rechargeable batteries from discharging. Note that regular-battery users don't have this problem, since the batteries are never connected to the AC adapter. But all Model 100 owners should unplug the adapter from the wall socket if it's not going to be used, to reduce your electric bill.

—Ed.

## CALCULATOR CORRECTION

The listing for Andy Barbolla's CALC.BA program (see Utility Corner in the May 1986 issue of Portable 100, page 61) has a few problems.

The calculator program employed special Model 100/Tandy 200 graphics codes — and used these Grph-key combinations literally in string expressions. But few letter-quality printers can display those codes — and ours substituted other characters in lines 44, 70 and 86.

We asked Andy to provide a modification to CALC.BA which would use CHR\$( ) codes instead of special characters. His replacements to those three lines are given below.

```

44 SS = CHR$(137)
:P=15
:GOSUB 76
:IF D=0 THEN D=TB
70 PRINT @L-20, STRING$(9,32);
CHR$(245);STRING$(9,32);
"0";
:RETURN
86 L=OF+65
:S1=OF*6+86
:S2=OF*6+152
:CLS
:LINE (S1,3)-(S2,59),1,B
:LINE(S1,19)-(S2,19)
:PRINT @OF+136, "7 8 9 ";
CHR$(137); " * "
:PRINT @OF+176, "4 5 6 7 /"
:PRINT @OF+216, "1 2 3 + "
:PRINT @OF+256, "0 . C = "
:RETURN
    
```

In the future, we'll indicate special unprintable characters as CHR\$( ) codes, making our listings easier to type in — and the programs easier to telecommunicate, too.

—Ed.

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# Save Money With Efficient Dialing

**O**n the Model 100 and Tandy 200 TELCOM screens, you'll find a number after the communications parameters; something like STAT M711E, 10PPS. The owner's manual says that 10 pps and 20 pps are the two pulse-dialing speeds for the laptops. But so what?

Most of us feel a bit of wonderment about telephones — we know that electricity is involved but don't give much thought to what is inside. So when I learned that you can dial phone numbers by tapping on the hookswitch (as if hanging up the phone repeatedly) some of the mystery was dispelled. You can do this yourself — tapping the switch five times is like dialing 5, and so on. This is exactly how the Tandy 200 and Model 100 dial numbers — by repeatedly opening the very relay that is used for hanging up the phone line.

The timing of the dialing clicks is important, and has been standardized for many decades. The ten clicks involved in dialing 0 should take one second (anything from 0.8 to 1.1 second is allowed). Each click thus takes up one-tenth of a second, or 100 milliseconds. (A millisecond is a thousandth of a second.) The break in the line (relay open) due to one click should occupy about 60 of the 100 milliseconds; the remaining 40 milliseconds is a time when the relay should be closed. We say the pulses have a *duty cycle* of 60 percent. (Most central offices accept any duty cycle between 58 and 64 percent.) The central office expects the telephone to wait at least 600 milliseconds between digits; this is called the interdigit interval.

The Model 100 uses a routine at 21293 to dial digits; it uses a duty cycle of about 64 percent and an interdigit interval of about 800 milliseconds. The comparable Tandy 200 routine is at 25131.

## NEW STANDARDS

Everything described up to this point has to do with 10 pps dialing, which has been the standard for many

years. But about half of the country's central offices, the newer ones, can accept 20 pps dialing. The pulse rate must be between 17 and 21, the duty cycle should be between 62 and 66 percent and the interdigit interval must be at least 300 milliseconds. The Model 100 routine uses a pulse rate of 20, a duty cycle of 60 percent and an interdigit interval of 400 milliseconds, so it satisfies the newer standard.

The Model 100 dialing rate is determined by a flag at 63019, where a value of one means 10 pps and a value of 20 means 20 pps. In the Tandy 200 the flag is at 61172, and values of one, 20, and zero represent 10 pps, 20 pps and tone dialing respectively.

When the Model 100 or Tandy 200 is cold-started, 10 pps is selected. Many users never change it, which is fine since every central office accepts 10 pps dialing. But in the 10 pps mode, how long does it take to dial a phone number? Consider a typical number, such as 943-4700, the Tymnet access number for Manhattan. Before it dials a call, the Model 100 hangs up the line for two seconds to be sure that when it picks up it will get a dial tone. The 9 takes 900 milliseconds, there is a 400-millisecond interval, the 4 takes 400 milliseconds, and so on. All told the digits take 4.7 seconds, and the intervals total 4.8 seconds, for a grand total of 11.5 seconds.

Now suppose you used 20 pps. The initial two-second on-hook time for the dial tone remains, but the dialing goes twice as fast, so that the process finishes in about 6.7 seconds, quite a savings. (Tone dialing is even faster, at 95 milliseconds per digit.)

The phone company prefers you to use 20 pps (and likes tone dialing even more) because it must allocate a so-called *digit receiver* during the whole time you are dialing, and if you use 20 pps or tone dialing it can give the digit receiver, which is very expensive, to another customer a little sooner. You benefit from 20 pps dialing because you get connected sooner to your destination.

Why, if the phone company saves money when you use tone dialing,

does a touch-tone line cost extra? In many states this is because the state regulators require the extra charge; the revenue is used to subsidize pay phones or basic budget service.

## WHAT'S THE HOLDUP?

Since it is free, why doesn't everyone use 20 pps? First of all, many people don't understand it. Second, the sad fact is that some central offices, particularly very old ones, cannot accept 20 pps. In technical terms, a central office that does accept 20 pps dialing will be a so-called No. 1 Crossbar office, a No. 5 Crossbar office or an ESS office. (Your business office can tell you what kind of central office you have.) Whenever you're ordering phone service it is wise to get one of these types, preferably ESS, so that you can have not only 20 pps dialing but also other special features like equal access and call-waiting.

As older central offices are upgraded to prepare for equal access, more and more phone lines work with 20 pps dialing. You can surely use 20 pps if your phone exchange has been converted to equal access or if you are able to get custom calling features such as call-waiting and call forwarding. If you're not sure you have equal access, dial 1-700-555-4141, a free call. If the call does not go through, you don't have equal access (but may nonetheless be able to use 20 pps). If the call goes through, you'll get a recorded message indicating which long-distance carrier you're hooked up to; you can certainly use 20 pps dialing.

In a nutshell, here's how to decide on a dialing method. Start with tone dialing (if you have a Tandy 200) since that is the fastest. If it works, use tone dialing. If tone dialing does not work, or if you have a Model 100, then try 20 pps since it is also pretty fast — if it works use it. Only as a last resort should you revert to 10 pps dialing.

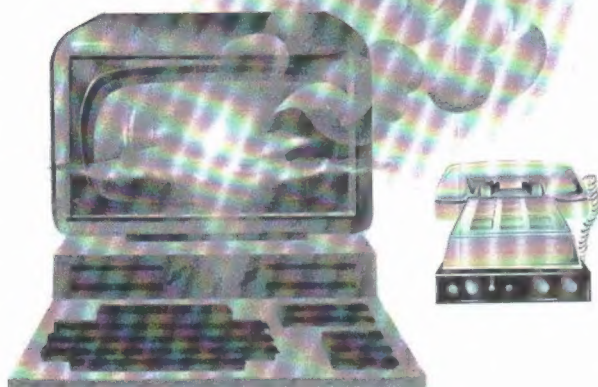
And of course, if at some moment you're dialing from a different phone exchange than usual, you might as well try tone and 20 pps dialing, since either works it will save time for you.

—Carl Oppedahl



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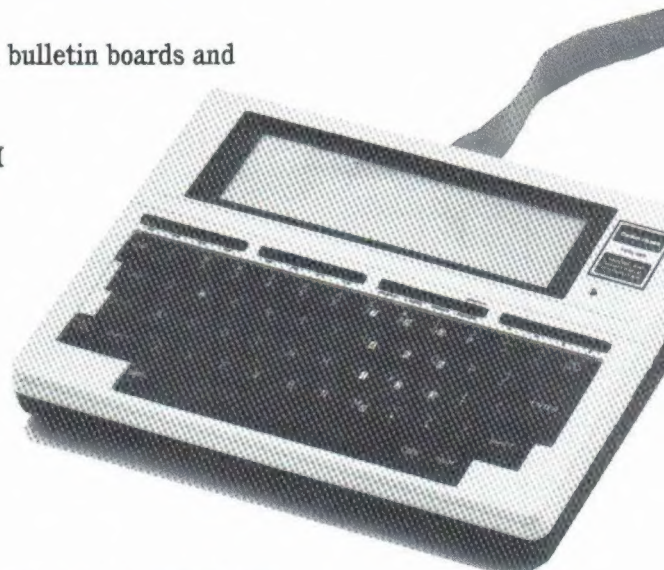
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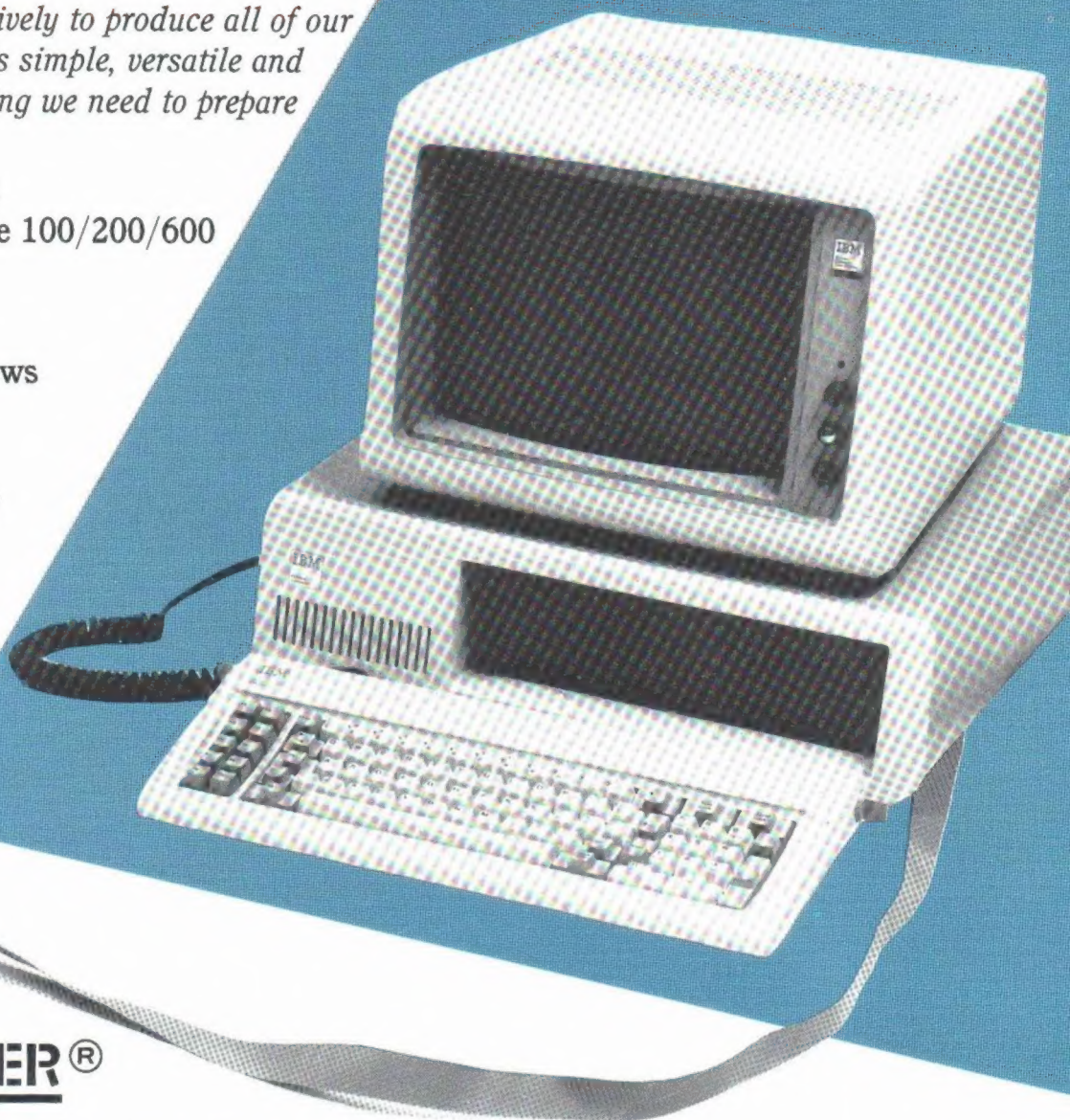
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LAPDOS allows you to easily use your database, spreadsheet, or word

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